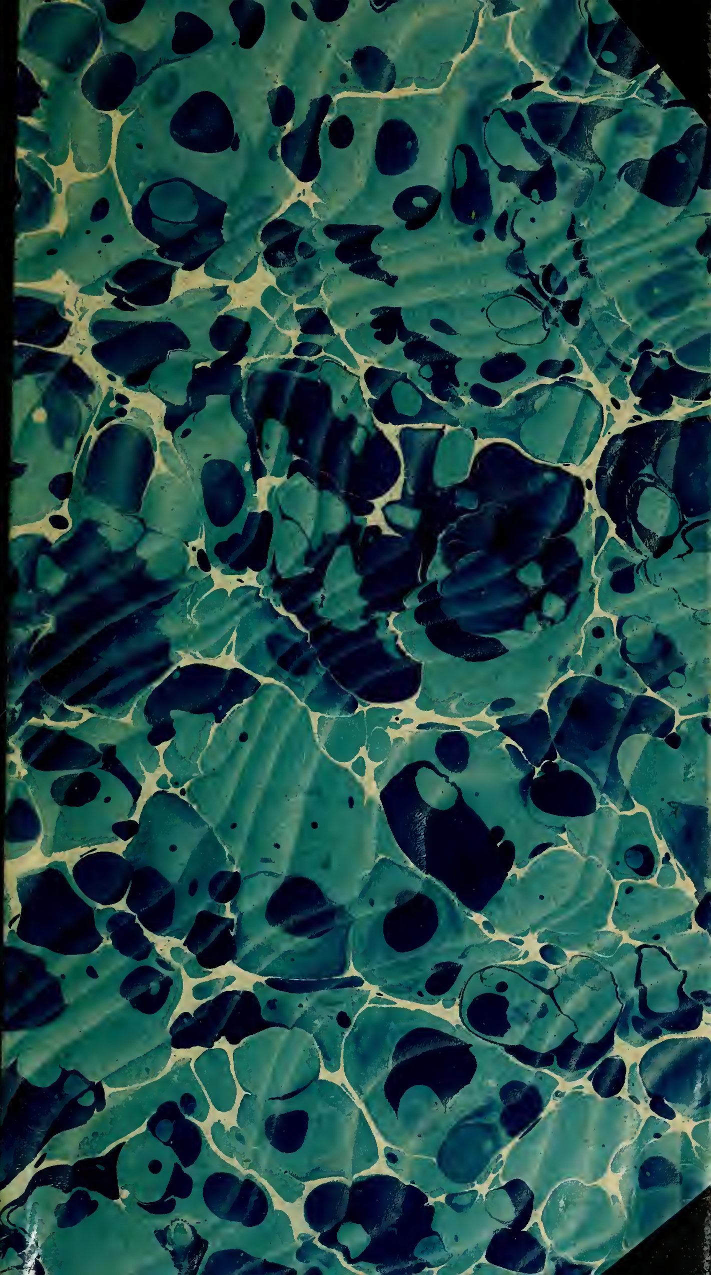


Digitized by the Internet Archive
in 2010 with funding from
CARLI: Consortium of Academic and Research Libraries in Illinois

http://www.archive.org/details/annualreportofbo02inchic

SECOND ANNUAL REPORT

OF THE

BOARD OF PUBLIC WORKS

TO THE

COMMON COUNCIL

OF

THE CITY OF CHICAGO.

APRIL 1st, 1863.

CHICAGO:
TRIBUNE BOOK AND JOB PRINTING OFFICE, 51 CLARK STREET.
1863.

BOARD OF PUBLIC WORKS.

COMMISSIONERS.

BENJAMIN CARPENTER, *President.*
FREDERICK LETZ, *Treasurer.*
JOHN G. GINDELE.
FRANCIS C. SHERMAN, *Mayor,*
And ex officio Member of the Board.

OFFICERS.

A. W. TINKHAM, *Secretary.*
E. S. CHESBROUGH, *City Engineer.*

COMMISSIONERS' REPORT.

OFFICE OF THE BOARD OF PUBLIC WORKS,
CHICAGO, April 25th, 1863.

To the Mayor and Aldermen of the City of Chicago, in Common Council assembled :

The Board of Public Works respectfully submit herewith a report of their acts and doings for the fifteen months ending the first of April, as required by the provisions of the revised City Charter.

WATER WORKS.

No large additions to the works have been made during the period covered by this report, other than in laying down distributing mains.

DISTRIBUTING PIPES LAID.

50,881 feet, or $9\frac{3361}{5280}$ miles, of distributing pipes, of 4, 6 and 8 inches diameter, have been laid down, the amount in the three divisions of the city being as follows, viz. :

South Division, - - - -	11,426 feet.
West " - - - -	26,271 "
North " - - - -	13,184 "
	50,881 feet.

The whole amount of distributing mains now in connection with the works, is 98 miles and 2,643 feet.

The supply mains, not included in the above, are in length 6 miles and 2,247 feet, making the whole amount of pipes laid in the city, of all sizes, 104 miles and 4,890 feet.

COST OF THE WATER WORKS, AND HOW PAID FOR.

The Water Works had cost, at the first of the present month, - - - - - - -	$1,118,494.9
There have been issued six per cent. Water Loan bonds, amounting to $1,030,000, which were generally sold at their seven per cent. par value. Deducting, for the discount thus made, $82,235.41,	947,764.59
Seven per cent. Water Loan bonds sold at par,	103,000.00
Balance derived from Water rents, - - -	67,730.38
	$1,118,494.97

INCOME OF THE WATER WORKS.

Water rents received from January 1, 1862, to March 31, 1863, inclusive, - - - -	$188,448.28
Profits tapping pipes, - - - - -	846.52
Total income for fifteen months, - -	$189,294.80

EXPENSES AND REPAIRS OF WATER WORKS.

Interest on water loan bonds, - - - - -	$71,306.77
Expenses at pumping works for 15 months, as above,	20,471.16
Miscellaneous repairs, including new inlet house, and dredging basin, - - - - - - - -	9,649.26
Miscellaneous operating expenses, - - -	21,187.32
Total for the fifteen months, - - -	$122,614.51

Besides the above, there were expended by the Board, in laying distributing mains, - - - - -	$39,197.17
Making other permanent additions to the works, -	$5,031.44

QUALITY OF THE WATER.

Last spring, at the time of the spring freshet, the accumulations which had gathered in the river, and under the ice, during the winter, were suddenly discharged into the lake, and by the southerly winds that then prevailed, were forced along the lake shore, north of the river, for a long distance, rendering the water very bad for three or four days. Since that time there has been little cause for serious complaint. The water has been good, with but one or two exceptions.

The opinion was expressed in our last report, or that for the year 1861, that measures then proposed, would, when carried out, rid the water of the small fish which were then so abundant as to make the water in some localities very offensive, and in fact caused more complaint as to the quality of the water than anything else. It was only at the beginning of last winter that the new inlet house, the proposed means to exclude the fish, was got into use; and since then they have been kept out of the pipes. They have been kept out, however, only through constant watching day and night, and cleansing and maintaining in good order the various screens through which the water passes. At the mouth of the inlet, the water has swarmed with them all winter long.

The Board have not been idle during the year in regard to the measures to be taken for permanently bettering the quality of the water, so that it shall not be liable to be reached by any of those influences which now occasionally injuriously affect it, and in particular that it may be secure from the discharge from the river. During the year, the subject has been under continual examination and discussion, and such surveys have been made as have seemed necessary.

It will be readily apparent to those who have considered the subject at all, that a change in the supply of water to be furnished to the city, whether it be effected by erecting pumping works in another locality, or by conveying water from another part of the lake to the present pumping works, cannot be effected by any hastily gotten up contrivance, or by any work of small cost. The change will require a good deal of time and money.

PROPOSED PLANS FOR IMPROVING THE QUALITY OF THE WATER.

In discussing the various projects which have been examined for improving the supply of water, the Board have come to the following conclusion:

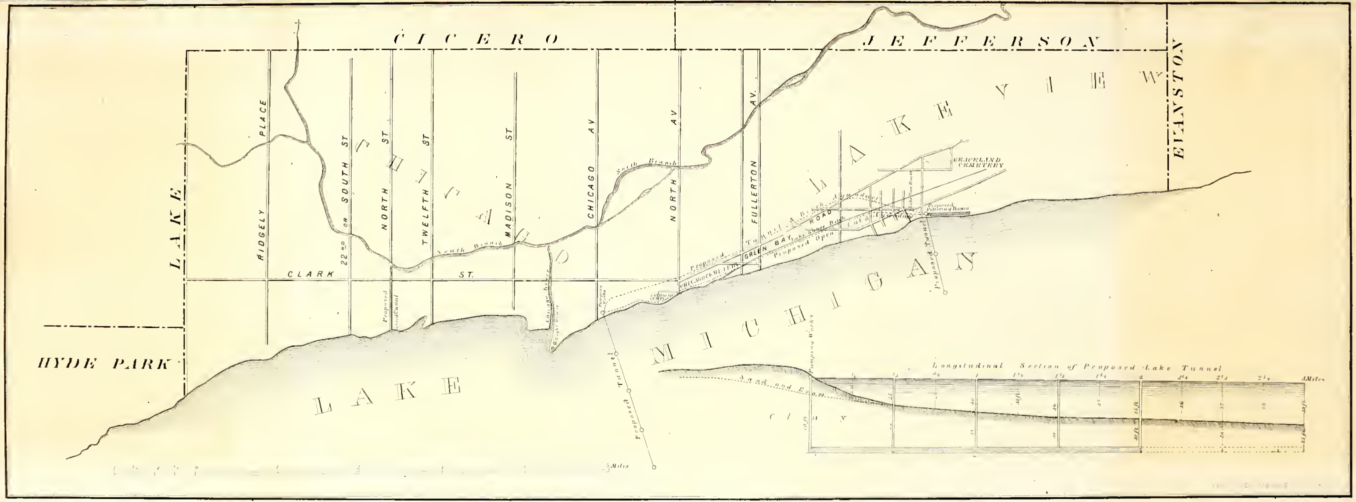
That what is most to be desired by the city is, that the supply should be drawn from the deep water of the lake, two miles out from the present Water Works, where the water is subject to no impurities, except occasionally the slight milkiness which the lake has after a long continued north-east blow, and where it is clearer and cooler in summer than in shallower waters, and where also the and occasionally during the year, does not arise from any mixture of the river with lake water. It might almost be said that it is never more likely to be free from it than when having this appearance. The water of the lake always has this turbid, milky appearance after agitation by winds, especially by north-easterly winds; and for miles out from the shore, the lake will be found more or less thus discolored, becoming not clear even at the distance of five miles from the shore. It arises from the action of the waves on the clay and gravel banks bordering the lake to the north. We do not think that it is in any way injurious, and the water, at the distance of two miles from the shore, will have very much less of it than the water near the shore.

Recently observations were made during the prevalence of easterly winds, when the waters of the lake were turbid, as stated above, at Winnetka, fifteen miles north of here, and at the same time at the pumping works. Specimens of the water were taken at the shore, at both localities, and at half mile distances out for five miles. The Winnetka water was apparently a little more turbid than the water off the pumping works; otherwise there was no perceptible difference in the specimens taken. This increased turbidness of the Winnetka water was owing, doubtless, to the fact that there the lake washes against banks of clay, and here against shores of sand and gravel.

The estimated cost of the tunnel extending two miles out into the lake from the pumping works, is $307,552.

This estimate does not include, however, any provision for a light house, which it will be necessary to place on the outside pier, if it be allowed to remain above or near the surface of the lake after the tunnel is built.

One other project which has been discussed is, to make along the lake shore some five miles north of the present pumping works, a large, natural filtering or settling basin, from which the water shall be conveyed to these works by a five foot brick aqueduct. For settling and freeing the water from sediment, we are of the opinion that the basin would be found effective, and would continue to be so, but that for filtration it is not safe to rely upon it. There have been filtering basins of this character in other places. Some of them appear to have continued to work well during long use, and others have failed and become useless.


CICERO
JEFFERSON
EVANSTON
LAKE VIEW
GRACELAND CEMETERY
Proposed Filtering Basin
Lake View House
LAKE
HYDE PARK
CHICAGO
RIDGELY PLACE
22ND OR SOUTH ST
NORTH ST
TWELFTH ST
MADISON ST
CHICAGO AV
NORTH AV
FULLERTON AV
CLARK ST.
GREEN BAY ROAD
Lake Shore Ditch
South Branch
North Branch
CHICAGO CEMETERY
CATHOLIC CEMY
Pumping Works
Proposed Tunnel
Proposed Tunnel & Brick Aqueduct
Proposed Open Cut & Tunneling
Proposed Canal
Chicago Harbor
Light House
LAKE MICHIGAN
Longitudinal Section of Proposed Lake Tunnel
Sand and Loam
Clay
3 Miles
2
1
1/2
1/4
3/4
1 1/4
1 1/2
1 3/4
2 1/4
2 1/2
2 3/4
3 Miles
35 ft
31 ft
25 ft
36
37
38

The greatest objection to this project is, that the water will be taken along the lake shore, where the water will not be as good as that taken from where the lake is deeper. It will be remembered too, as already stated, that the river discharge a year ago followed along the lake shore more than this distance of five miles, and its presence was very noticeable here; neither settling nor filtration would remove the taste of it. The cost of this basin and aqueduct is estimated at $300,575.

It has been suggested too, that instead of tunneling under the lake abreast of the city, it will be safer to get away a greater distance from the mouth of the river, and that starting from the proposed location of the basin spoken of above, and in place of it a tunnel be run out under the lake as far as may be thought necessary, and an inlet at the shore be also made, the water to be conveyed by a brick aqueduct to the present pumping works. The estimated cost of five miles of aqueduct of a diameter of five feet, and one mile of tunnel of the same size, with an inlet pipe and gate house, so that the water can be taken by an inlet near the shore or through a tunnel from the deep water as may be preferred, is $380,000.

That you may more conveniently compare the cost of the three projects, which have been briefly described, we give again their estimated expense:

To obtain water by running out from the pumping works two miles, and to a depth of thirty-five feet, by a tunnel five feet in diameter, is estimated to cost without a light house, - - - - - - -	$307,552
To construct a filtering or settling basin on the lake shore, five miles north of the Water Works, and to convey the water thence to the works by a five foot brick aqueduct, is estimated to cost - - -	$300,575
To obtain water from five miles north of the works and one mile out into the lake, (depth thirty feet if the same as one mile off the pumping works), by a five foot tunnel and aqueduct, with the inlet and gate house referred to, is estimated to cost - - -	$380,000

We accompany the report with a small map illustrating these various projects.

In another part of this report will be found recommended a plan for purifying the main Chicago river, and the South Branch north of North street. It is safe to suppose that any arrangement which will produce a constant current in the river, or which shall otherwise purify it, will also lessen or prevent the injurious action of the river on the lake water.

Having thus set before you our views as to the best means of so obtaining a supply of water that it shall never be made impure by the river, we can hardly with propriety omit saying, that it has been with great regret that we have observed the serious misapprehension by many of our citizens, in regard to the ordinary condition of the water supplied by the works, and a disposition to exaggerate what real but occasional trouble has existed in regard to it. Ordinarily the water of the city is as good as that furnished to any city. Only during the freshet alluded to was the water seriously contaminated by the river discharge ; once or twice since then, has it been slightly affected by it, but that is all. The turbidness arising from northerly and easterly winds is harmless, and is found everywhere along the shore of the lake, but it has been made the occasion for statements that the daily drink of our citizens is the discharge of the sewers, the refuse of slaughtering establishments, etc. Such statements are wholly untrue, and cannot fail to do harm.

AMOUNT OF WATER LOAN BONDS WHICH CAN BE ISSUED.

The authority given to the city, to borrow money on account of the Water Works, is believed to be more than sufficient for any works which will have to be undertaken, whether for bettering the quality of the water, or for enlarging the works to keep up with the growth of the city. It will be necessary soon to erect another large pumping engine, and the annual expenditures for extending the distributing mains is ordinarily as much as $50,000.

It will be observed that the revenue, besides paying the annual interest, operating and keeping the works in repair, affords a surplus, which whether used in the purchase of outstanding bonds, or in enlarging the works, and so increasing their revenue, as is authorized by the lately revised city charter, goes to securing the payment of the loan. The Board have had no occasion to issue any water loan bonds during the period covered by this report.

Of the loan authorized Feb. 16, 1857, there remains to be issued, - - - - - - -	$187,000
The recently revised city charter authorized an additional loan of - - - - - - -	500,000
Whole amount authorized to be issued in addition to those now outstanding, is - - - - -	$687,000

CHANGE OF WATER TAX LAW.

Among the changes made in the recent revision of the city charter, was one making the water tax in all cases a lien upon the lot, as well as upon the building, whether the lot and building are owned by the same owner, or by different owners, and providing for the sale of the lots at the annual city tax sale, if the tax remains unpaid for a specified time. Both of these provisions will be found to be beneficial to the city.

WATER METERS.

The Board have found it advantageous to increase the number of meters, and believe that their use is satisfactory generally to the parties whose rates are determined by them, as well as to the Board. There are now on hand seventy-six water meters, all of the Worthington patent, and there have been ordered twenty-three more. The water rates determined by meter during 1862 and the first quarter of 1863, amount to between $17,000 and $18,000.

PIPE CONTRACTED FOR.

The Board, late last season, agreed with Messrs. R. D. Wood & Co., of Philadelphia, for the delivery of 700 tons of four, six and eight inch pipes as soon as practicable after the opening of navigation, 300 tons at the price of $41, and 400 tons at the price of $46.50 per ton of 2,000 lbs.

CHICAGO RIVER.

Much attention has been given by the Board to the means to be adopted for purifying the river. The cleansing or flushing of the river, by the introduction of lake water in large quantities by communications connecting the lake with the North and South Branches, is apparently the best of the various methods suggested, and we have no doubt that the river could be kept comparatively pure in this way, and so that it would never become offensive. Without however, at present, proposing the construction of the largest of such works, we recommend that the first work of this character to be undertaken, be an aqueduct, to be made through North street, connecting the lake with the river, and that the necessary machinery be erected for pumping the lake water into the river in such quantity as to change the water between North street and the mouth of the river once in twenty-four hours when necessary.

The proposed aqueduct will be circular in form, twelve feet in diameter, and covered, the top of it being several feet below the level of the lake. The pumping machinery can be arranged to pump both from the lake into the river, and from the river into the lake.

It is believed that the water to be forced through this canal, will keep sufficiently pure all of the main river, and all of the South Branch between the main river and North street. The North Branch and that part of the South Branch south of North street, may not be materially benefited by it. If it is found to work well, a similar construction can afterwards be made for flushing out the North Branch.

It is proper to remark, that while it is probably true that the beneficial effects of the North street canal will not be felt beyond the district named, it will nevertheless remove all *sewerage* matter discharged into the river. Every sewer outlet on the river or its branches, is along the main river and the South Branch north of North street. Whatever of filth is generated in the South Branch south of North street, and in the North Branch, by slaughtering establishments, distilleries, etc., is made in defiance of the city ordinances.

The estimated cost of the covered brick aqueduct, with its pumping machinery complete, is - - -	$140,000
There will be an estimated annual expense connected with the machinery, for coal, services of engineer, fireman, etc., and for repairs, of - - - -	$7,500

These two works, that suggested for improving the supply of water to the city, and this last for purifying Chicago river from its mouth to North street, we present for your consideration, and request that you will as soon as practicable take action with reference to them. If approved by you, we recommend that an ordinance be passed authorizing this Board to take immediate steps for their construction.

SEWERAGE WORKS.

15,685 feet, or about three miles of sewers were built during 1862, making now the whole amount of public sewers laid, $57\frac{1128}{5280}$ miles. The sewers built last year were generally brick sewers, more than half the amount being of sewers of $4\frac{1}{2}$ feet diameter.

The cleansing of the sewers for the fifteen months ending April 1, 1863, cost - - - - - -	$4,897.24
The repairs of the sewers for the same period, cost -	3,024.07

The balance of account in our last report, stated to be due from S. Lind, Treasurer of the late Sewerage Board, has not yet been paid. The amount now charged to him is $108,696.53.

By the late charter amendments, an additional issue of sewerage bonds of $500,000 was authorized.

GENERAL CITY DEPARTMENT.

STREETS AND SIDEWALKS.

During the two years since their organization, the Board have endeavored to keep the streets and sidewalks of the city in as good condition as was possible, with the limited amount of money at their disposal. Good streets and sidewalks are essential where much business is transacted. In a large city everything must be done that is possible, to make the transportation of merchandise easy, and to facilitate the movements of persons and vehicles. The street improvements of Chicago have hardly kept pace with its buildings, and with its various private enterprises. Some of them, as for instance Lake street, are of the best description, and in good order, but this is not their usual condition. All of the principal thoroughfares connecting the city with the country are very much out of repair, and cannot be brought into good condition without making them anew, at a large expense. Nearly all of the graveled and macadamized streets made before the formation of the Board, are very much out of repair, and ordinarily the streets are not kept up to a good condition after being once improved. The usual way, heretofore, has been to improve a street, and then do but little until the pavement or other prepared road covering was worn out and required an entire renewal, the streets in the meanwhile getting in worse and worse condition, and being more or less unserviceable after the first year or so of use. Nor is it possible to have it otherwise, unless the city will expend more money on the streets than has been appropriated for the use of the Board. As much money should be spent annually on the streets as shall be necessary to maintain them in their original shape, and with as good a surface as shall be practicable with the wearing away of the material covering the street. The larger our city has become, the smaller have grown the appropriations for keeping the streets in good repair, as will be seen by the following statement.

Including the street taxes collected annually, there have been expended for street cleaning and repairs in the three divisions of the city, during each year from 1857 to the present time, about the following sums:

In the year 1857,	$70,260[*]
" " " 1858,	69,502[*]
" " " 1859,	54,568[*]
" " " 1860,	40,535[*]
" " " 1861–2, (Board of Public Works),	35,200[†]
" " " 1862–3,	30,666[†]

The estimates of the Board for the two years 1861 and 1862, were respectively, $54,600 and $58,000, and the appropriations $32,000 and $20,666, and the street taxes, amounting—including the expense of their collection—to about $10,000 more. The Board must always have available some money with which to buy plank and stone and other materials at the beginning of the fiscal year, before collections can be made of the general taxes, and so by stinting, managed to have some $7,000 unexpended at the close of their first year, with which to buy oak and pine lumber, gravel, stone, etc., at the commencement of 1862.

The appropriation by the Council last year for all expenditures on the streets, alleys and sidewalks, was $20,666, or but about one twenty-seventh part of the whole tax levy. The condition of the streets is a matter of such general interest, that the Board can hardly believe that the citizens would be unwilling to increase this small tax to three or four times the above amount, if by so doing they can have better streets.

The ordinary repairs of the streets in our judgment should be paid from the general fund, and not by special assessment. It is especially unjust to impose the whole burden of keeping our leading thoroughfares in good condition upon those few lots which abut on the thoroughfares, while the whole city wears out and is benefited by these highways.

We especially urge upon the Council that the past system of neglecting our streets when once improved until wholly worn out, ought now to end, and that sufficiently liberal appropriations be hereafter made, to enable the Board to keep in good repair as long as may be possible, such streets as have been lately improved, or which you may hereafter order to be improved. This is especially important in regard to graveled and macadamized streets.

---

[*] Not including culverts, which were built by special assessments.

[†] Including culverts.

The subject is one of so much importance, that we trust we shall be excused in setting before you at some length, our views as to the various ways in which the streets of the city have been improved.

Before the enlargement of the city by the late charter amendments, there was in the city the following length of streets, every mile of which needed more or less labor :

In the South Division, - - - -	77½	miles.
“ West “ - - - - -	207½	“
“ North “ - - - - -	78½	“
Total, - - - - -	363½	“

Included in this amount of streets were the improved streets within the former city limits, measuring about as follows :

Nicholson pavement, - - - - -	1⅘	miles.
Block stone, - - - - - - -	1	“
Boulder or cobble stone pavement, - -	2½	“
Macadamized or graveled streets, - -	22	“

There are now in the city more than 400 miles of streets.

The permanent improvements of the streets began about the year 1855, and have been made in the various ways just enumerated.

NICHOLSON PAVEMENT.

So far as our present experience goes, the Nicholson pavement is the best adapted to our most important streets where the buildings are of a permanent character, and the traffic large. As our experience in regard to this pavement dates back no farther than 1856, we can only say, that after between six and seven years heavy wear, as at Wells street between Lake and South Water, the pavement is yet in good condition, and seems likely to last a considerable time longer. Blocks of pine taken out last year from this Wells street pavement, were worn down in height but half an inch, then measuring five and a half inches, their first height having been six inches. Pine we have thought preferable to oak, as the softness, toughness and elasticity of the same admits the impression of the fine gravel on the top of the blocks, thus making a very hard surface, and with the spreading and brooming of the blocks at their edges closing almost the whole joint between them, so that in connection with the saturation by the tar, it is completely protected. Such pine blocks taken out at the intersection of Wells and Lake streets after six years wear, had a perfectly sound appearance, as if put in but the previous month.

BOULDER STONE PAVEMENT.

The boulder stone pavement has been put on several of the most traveled streets. In Lake street the boulder pavement was ruined in five years, and was replaced by the Nicholson pavement in 1861. The pavement in South Water street, of the same kind, is almost ruined, and needs a thorough repair. Clark street, between Lake and South Water streets, was re-paved last year, and the same process will be required again at least in two years. Randolph street, between Michigan avenue and the bridge, was paved with boulders in the fall of 1857, and will soon need repairing from State street to Market street. In streets less traveled than the above named, this pavement shows less holes than in them, but it still has so much unevenness that teams avoid it wherever the Nicholson pavement is near to it in a parallel line. The boulder stones are very unequal in size, and therefore render an unequal resistance to impression. They are of a poor quality, as almost half of those brought to this market are very soft and marly, and cannot withstand the influence of the temperature. A selection of the best of the boulders in size and quality would make the boulder pavement cost almost as much as the Nicholson pavement. If good and sound boulder stones, nearly equal in size, could be got at a reasonable price, the Board would consider such a pavement suitable for streets not subject to heavy teaming.

BLOCK STONE PAVEMENT.

Some of the streets have been paved with block stone or limestone pavement. The blocks are of soft limestone, with many seams. If such blocks were on their bottom beds of the same size as on the top, such a pavement would resist far better the weight of heavy teams than it now does. But as the stones, as put in by the contractor, are generally of unequal size and smaller on the bottom than on the top, the pavement settles unequally, and the corners on the joints and larger pieces are broken off. Thus holes will appear more and more, and the joints will wear out, so that the felloes of wagons will be forced between the blocks, as can be seen in South Water street, between Wabash avenue and Michigan avenue. In streets without much heavy traffic, as Washington street, La Salle street and others, this pavement may last a number of years, but with more or less jar and noise, as with the boulder pavement.

MACADAMIZED AND GRAVELED STREETS.

In regard to most of our macadamized and graveled streets, much is to be done and a thorough reform is required. The city has at this time twenty-five miles of macadamized and graveled streets. Whoever has observed the improvement and construction of such streets, built since 1856, as for instance, Canal street, Milwaukee avenue, Rush street, Kinzie street, State street south of 12th, Archer road, etc., must have seen that all sizes of stones, large and small, and of different shape, have been thrown in the street without much selection, and covered with a thin course of finer stones. On those streets large stones up to the size of one-half of a cubic foot can be seen to-day mixed up with smaller stones. Many of the streets have been built of stones greatly differing in size and having an unequal ability of resistance, including limestone and Joliet gravel. Very much depends upon the manner in which such streets are constructed. When the large stones are put first on the ground carefully, then smaller ones above the same, and the smallest on the top, a street can be built tolerably well. A sample of such a street can be found on Old street, from State street to Old street bridge, on which many and heavy teams are passing daily. The surface consists of very small stones, equal in size, and forming a very hard and compact mass, the material used being limestone.

Samples of good graveled streets we have on Madison street, between State street and Michigan avenue, and also in front of the Terrace Block on Michigan avenue, between Van Buren and Congress streets. Both of these graveled streets have been constructed with care, and such streets as these can be recommended for avenues without a heavy travel. As the Mount Joliet gravel contains a considerable amount of fine sand and marly stuff, which cannot resist the influence of the temperature, frequent heavy teaming will, and always has, cut into and ground up such streets. The big stones are forced to the top, and in dry weather the street is very dusty, and in rainy weather is almost impassable with mud. State street south of Twelfth, Clark street, and Kinzie street, show the truth of this statement.

After various streets of the above kind had been constructed, up to the year 1859, either the idea seemed to prevail that such new streets did not require any repair for a long time, or else, though such repair was known to be necessary, the city did not provide sufficient means to preserve them in good condition. Yet the expenditures on the streets in the years 1857–58–59, were twice as much as under the Board in 1861–62. The injurious results of neglecting these streets, whether it was done from one cause or the other, have long been apparent, and are daily increasing. The slight repairs which were attempted did not take place until the streets were in an almost impassable condition, and cut through to the ground, and so filled with numerous mud holes, which swallowed down the material soon after it was thrown in. In this condition the Board found many of these streets, and with the limited means placed at our disposal, we have been unable to remedy the evil, already of great extent.

It is an old rule that a street should always be kept as near as possible in its original shape, and in keeping the streets in good order, it should be observed as a matter of economy. But if a street is neglected to such a degree as has been usual with our leading thoroughfares, it will be difficult, and very expensive, to restore it to a satisfactory condition.

The Board have built up to this time two macadamized streets of bituminous limestone, namely, Monroe street, from State street to Clark, and North Wells, from Kinzie street to Green Bay road. The original manner in which macadamized streets were built, has been considerably improved during a number of years, and after many experiments by French engineers, a system has been adopted which affords great advantages over the old method, and gives much satisfaction. Precisely the same system of construction was applied to these two streets. The average thickness of the stone body is fifteen inches, and it was put on in two different courses. The lower course consists of broken stones in size from two to three inches, and was eight inches thick. The upper course had a thickness in the center of ten inches, and on both sides of four inches, averaging seven inches, with stones in size from one-half inch to two inches. Each of the courses was rammed separately with a heavy roller. For filling up the interstices between the stones, and to effect a solid bond of the mass, a course of fine cement gravel and fine limestone screenings two inches thick was put on the top. Although the size of the stones in the top course does not fully answer to the size as put down in the specifiations, on account of a defect in the machinery at the quarry, these streets are, nevertheless, good samples of their kind, and they will always remain in good condition while kept in their original shape and crown. Already these streets ought to be filled up, particularly North Wells street, about three inches for a width of ten feet in the center.

According as the material of a street is hard or soft, and the street narrow or broad, and as it shall be more or less traveled, in a corresponding degree will it wear out. In the middle of the traveled way this wear may yearly amount to from two to four inches, and in the average from four to eight per cent. of the whole body of stone. Supposing that a street like Wells street cost $10,000 per mile, which is not quite the real cost, the annual repairs to keep the street in the original shape would amount, at eight per cent., to $800. Now if the present system of leaving the streets without the necessary repairs be continued, Wells street will be ruined in six or eight years, and for more than half this time will be rough and inconvenient, and finally almost impassable. To have it then in sixteen years in good condition and in the original state, it will be necessary to rebuild it twice or twice and a half, at a cost (including interest) of from $25,000 to $35,000. On the other hand, if the shape and form of the street be kept in the original state by an annual expense of $800, the whole amount in sixteen years, including interest, would be but $18,560, which amount paid in yearly sums of $800 each, could hardly be considered a burden for the tax payers. This shows conclusively that the present system gives us poor streets most of the time, and is very expensive. The Board cannot too strongly urge this matter upon your attention, and they ask that hereafter adequate means be provided for keeping these streets in repair after they are once made.

To have at hand stone material for repairing the streets, the Board urgently recommend the purchase by the city of a suitable tract of land for a good limestone quarry, with two stone-breaking machines. The benefit of having a quarry belonging to the city would be very great. The Board would thus be enabled to get stone in such quality and quantity, and at such times as would be most suitable.

SIDEWALKS.

The frequent complaints about defective and irregular sidewalks have much embarrassed the Board, while in many cases we have been powerless to satisfy them. The Board had no right to build sidewalks under the old charter, nor indeed to repair them, nor had we the funds to pay for much of such work. A considerable portion of the street fund so spent on places really dangerous, was expended to prevent injury to persons and damages to the city. To prevent accident, the Board ordered their foreman to repair all such places, wherever found. Under the amended charter, the process for building and repairing sidewalks is more summary; and it may be hoped, that after the Council has passed the ordinances required to enforce its provisions, there will be less difficulty and delay in compelling parties to make needed walks or repairs.

STREET IMPROVEMENTS PAID FOR BY SPECIAL ASSESSMENT.

The following streets were improved during 1862, and paid for, or to be paid for, by the owners of property abutting thereon:

Nicholson Pavement.

Lake street from Wabash avenue to Central avenue.
South Water street, from Franklin street to Lake street.

Boulder Stone Pavement.

Clark street, from Lake street to the bridge.
Kinzie street, from Clark street to Wolcott street.

Macadamized.

North Wells street, from Kinzie street to Green Bay road.
Monroe street, from Clark street to State street.

Graveled.

Wabash avenue, from Lake street to South Water street.

BRIDGES.

Two new pivot bridges were built in 1862; one at Wells street, costing $6,000, and one at Clybourne avenue, the half cost paid by the city being $1,000.

PUBLIC BUILDINGS AND HARBOR.

The appropriations for these objects were limited, and the expenditures have been generally for ordinary repairs.

PUBLIC PARKS AND CEMETERY.

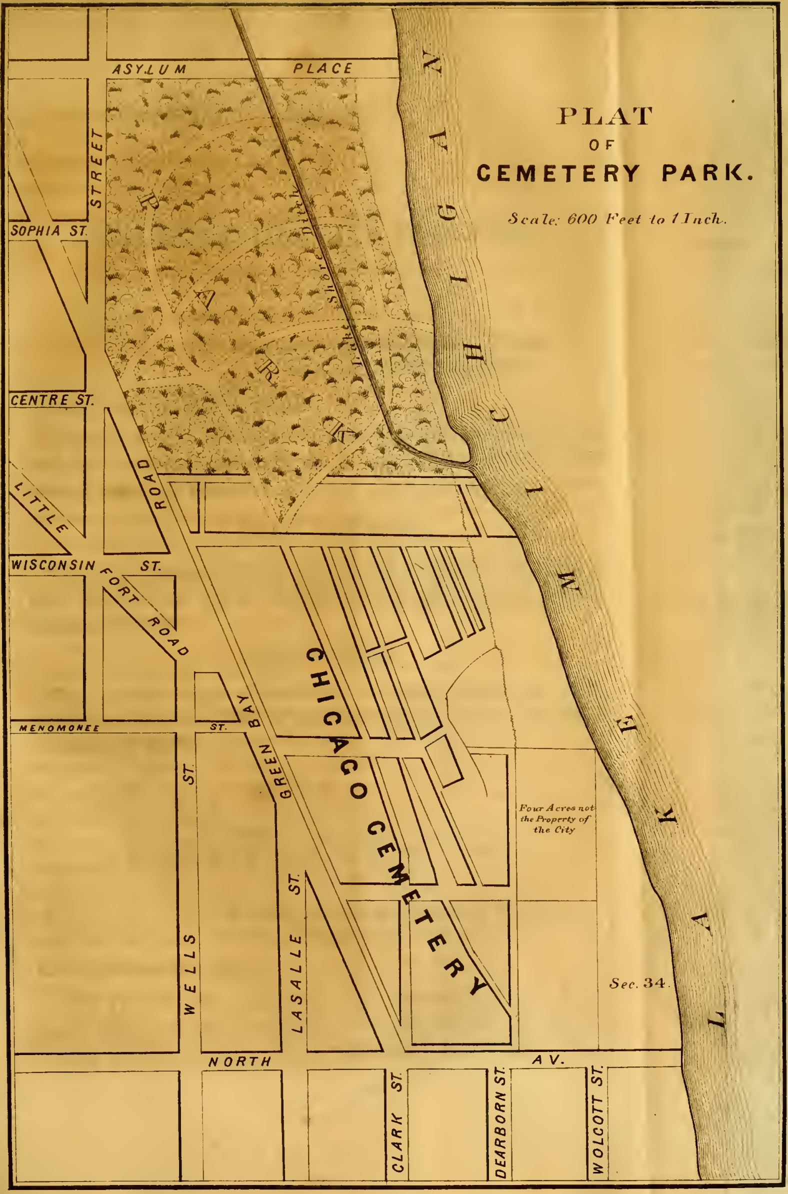
The work done in the Parks and Cemetery will be found fully exhibited in the report of the Superintendent of the Cemetery grounds and parks, submitted herewith. But little could be done for the parks, as the appropriation was very meager. We would recommend a more liberal appropriation for both these objects for the coming year. It would, doubtless, gratify the citizens to see well ornamented the small amount of public grounds which the city has. We especially recommend that liberal provision be made for laying out and improving the grounds to be used for a park at the north of the cemetery. That their location may be understood, we submit a small sketch appended herewith. It is desirable that a regular plan be determined on for ornamenting these grounds, and for drives and walks connecting with the cemetery and connecting streets, and that an annual appropriation be made to carry it out. This park will have an extent of about fifty acres.

STREET LAMPS.

It will be observed that under the provisions of the new charter, lamps erected in new districts will, hereafter, be paid for by special assessment on the lots along the streets to be lighted.

We respectfully invite your attention to the detailed statement of the expenditures by the Board, appended herewith.

B. CARPENTER, F. LETZ, J. G. GINDELE, F. C. SHERMAN,	*Board of Public Works.*



PLAT
OF
CEMETERY PARK.

Scale: 600 Feet to 1 Inch.

REPORT OF THE CITY ENGINEER.

Office Board of Public Works,
Chicago, April 1st, 1863.

To the Board of Public Works:

Gentlemen—Your Engineer would herewith respectfully present this his Second Annual Report; and in doing so, follow the order observed in his first.

WATER WORKS.

These are believed to be generally in as good a condition as they were on the 1st of January, 1862, and in some respects decidedly better.

PUMPING WORKS.

The condition and performance of these for the last fifteen months are fully described in the following report of the Engineer in charge of them.

REPORT OF ENGINEER OF PUMPING WORKS.

Engine House of Pumping Works,
Chicago, January 1st, 1863.

E. S. Chesbrough, Esq.:

Sir—The following statement of the operations of the Pumping Works, and other matters under my charge, for the year ending December 31st, 1862, is respectfully submitted.

THE PUMPING ENGINES

Have been in operation the past year 6,152$\frac{51}{60}$ hours, being an average of nearly 17 hours each day throughout the year, during which time they have made 3,369,071 revolutions, delivering 2,217,279,739 U. S. gallons of water, being an increase over the quantity pumped in 1862, of 450,125,050 gallons. Of the whole quantity

The large engine pumped - -	1,288,812,432	galls.
The small engine pumped - -	928,467,307	"
Total, - - - - -	2,217,279,739	"
Being an average daily quantity of	6,074,739	"

The coal consumed for this purpose amounts to 2,748$\frac{1211}{2000}$ tons. In addition to the above amount of coal, 138$\frac{1350}{2000}$ tons was consumed for maintaining the fires when the engines were at rest. There has also been consumed for pipe laying, work shop, heating engine house, etc., 82$\frac{1650}{2000}$ tons, making the whole amount of coal used for all purposes, 2,970$\frac{211}{2000}$ tons.

The following table will show the quantity of water pumped each month from 1858 to 1862 inclusive.

MONTHS.	1858.	1859.	1860.	1861.	1862.
January	81,538,179	106,905,665	132,284,454	137,651,918	151,971,047
February	69,426,515	106,401,412	130,800,720	142,071,067	168,931,788
March...........	82,677,463	102,415,983	150,831,680	135,576,447	192,937,942
April............	82,600,782	89,994,235	182,930,546	128,871,178	170,081,570
May	82,279,920	116,007,263	141,171,078	150,489,168	181,488,032
June	90,211,505	113,098,416	148,197,024	155,996,352	199,118,518
July	101,670,786	133,800,336	166,894,640	147,182,793	209,215,872
August..........	107,176,652	123,266,556	152,427,690	168,602,494	195,588,295
September.......	108,534,540	131,785,847	132,272,202	152,710,186	186,902,883
October	101,046,605	141,527,040	148,710,195	149,362,166	199,045,045
November	86,885,840	127,342,018	150,498,248	153,879,648	187,002,720
December	98,316,722	122,653,139	130,773,075	145,261,272	175,006,027
TOTALS......	1,091,865,457	1,415,147,910	1,716,786,552	1,767,154,689	2,217,279,739

The average daily quantity pumped for the above years was

1858	2,991,412 galls.
1859	3,877,118 "
1860	4,703,525 "
1861	4,841,547 "
1862	6,074,739 "

The supply of water the past year has been uninterrupted, with two exceptions, on the 24th of April, about 4½ hours, at night, for the purpose of cleaning out the pump well, and on the 25th of September, when it was found necessary to refit one of the steam "stop valves," requiring about five hours time, also at night. In each of these cases the reservoirs were full, and watchmen were stationed at each to let on the water in the event of a fire occurring.

Neither the engines nor boilers have received any extensive repairs the past year, those of any importance being the "stop valves" alluded to above, and the repairs done to the "delivery valves" of the large engine. In addition to the above, the engines have been painted and varnished, the labor of which was done by the engineers, the general appearance of the engines being greatly improved.

The following tables show in detail the operations of the engines, boilers, etc., each month of the past year.

LARGE ENGINE.

Months.	No. of Days run.	No. of Hours run.	Av. No. of Hours run per Day.	Average galls. of Water pumped per Day.	Whole number of galls. of Water pumped.	Pounds of Coal consumed for pumping.	Pounds of Coal consumed for maintaining fires when not pumping.	Total Pounds of Coal consumed.	Number of Revolutions made.
		H. M.	H. M.						
February...	21	330 51	15 45	6,058,256	127,223,376	325,000	22,900	347,900	155,911
March	26	429 46	16 32	6,437,863	167,384,448	435,585	26,400	461,985	205,128
April.......	3	42 56	14 18	6,361,264	19,083,792	45,180	1,400	46,580	23,387
May.......	11	169 54	15 27	6.036,619	66,402,816	170,395	10,800	181,195	81,376
June..... .	27	455 45	16 53	6,745,328	182,123,856	502,435	24,500	526,935	223,191
July.......	31	507 43	16 23	6,748,895	209,215,872	551,590	22,050	573,640	256,392
August.....	4	69 23	17 21	7,273,620	29,094.480	71.695	2,650	74,345	35,655
October....	28	429 12	15 20	6,414,634	179,609,760	434,115	22,400	456,515	220,110
November..	30	449 15	14 58	6,233.424	187,002,720	460,565	25,400	485,965	229,170
December..	22	287 40	13 05	5,530,514	121,671,312	279,828	21,400	301,228	149,107
Totals...	203	3,172 25	15 38	6,348,829	1,288,812,432	3,276,388	179,900	3,456,288	1,579,427

SMALL ENGINE.

Months.	No. of Days run.	No. of Hours run.	Av. No. of Hours run per Day.	Average galls. of Water pumped per Day.	Whole number of galls. of Water pumped.	Pounds of Coal consumed for pumping.	Pounds of Coal consumed for maintaining fires when not pumping.	Total Pounds of Coal consumed.	Number of Revolutions made.
		H. M.	H. M.						
January...	31	522 59	16 52	4,902,292	151,971,047	400,700	23,800	424,500	292 928
February...	7	136 45	19 32	5,956,915	41,708,407	104,200	3,500	107,700	80,394
March......	5	86 23	17 17	5,110,699	25,553,494	60,000	2,600	62,600	49,255
April.......	27	513 39	19 01	5,592,510	150,997,778	391,010	16,100	407,110	291,052
May........	20	376 14	18 48	5,754,010	115,080,216	268,805	12,150	280,955	221,820
June........	3	54 01	18 00	5,663,220	16,989,662	40,470	1,500	41,970	32,748
August......	27	514 22	19 03	6,166,437	166,493,815	373.903	13,400	387,303	320,921
September..	30	553 55	18 28	6,230,096	186,902,888	417,055	16,100	433,155	360.260
October....	3	57 33	19 11	6,478,428	19,435,285	42,095	1,500	43,595	37,462
December..	9	164 35	18 17	6,926,079	53,334,715	122,585	6,800	129,385	102,804
Totals..	162	2,980 26	18 30	5,781,280	928,467,307	2,220,823	97,450	2,318.273	1,789,644

Recapitulation.

ENGINES.	No. of Days.	No. of Hours.	Whole number Gallons water pumped.	Pounds Coal consumed for pumping.	Pounds Coal consumed for maintaining fires when not pumping.	Total pounds of Coal consumed.	Whole number of Revolutions.
		H. M.					
Large	203	3,172 25	1,288,812,432	3,276,388	179,900	3,456,288	1,579,427
Small...........	162	2,980 26	928,467,307	2,220,823	97,450	2,318,273	1,789,644
TOTALS.......	365	6,152 51	2,217,279,739	5,497,211	277,350	5,774,561	3,369,071
Excess of 1862 over 1861		185 07	450,125,050	867,723	44,185	911,908	715,758

April 1, 1863.

The following statement will show the operation of engines, boilers, etc., for the additional three months ending March 31st, 1863.

The small engine has been in use most of the time; the large engine was started on the 17th of March, since which time the pumps of the small engine have received a thorough overhauling, most of which was done by the employes.

The north boiler has also received some small repairs, the cost of which was $64.67.

The following table shows the quantity of water pumped for the three months of

January, 1863, - - -	169,900,255	U. S. Galls.
February, " - - -	158,108,450	"
March, " - - -	159,930,404	"
Total, - - -	487,939,109	"

Average number of gallons pumped per day, - - 5,421,545

The average number of gallons pumped per day during the corresponding period of 1862, was 5,910,273. The weather in the first quarter of 1862 was very cold, while in that of 1863 it was unusually mild.

The following table will show in detail the operation of the engines, boilers, etc., for three months:

MONTHS.	Days.	Number of Hours run.		Average number of hours run per day.		Pounds of coal used for pumping.	Pounds of coal used for keeping fires when not pumping.	Total pounds Coal consumed.	No. of Revolutions made.
		H.	M.	H.	M.				
January	31	520	37	16	48	386,600	21,800	408,400	327,487
February	28	489	—	17	28	371,980	17,700	389,680	304,758
March	31	471	25	15	12	421,800	22,600	444,400	256,772
TOTALS	90	1481	02	16	43	1,180,380	62,100	1,242,480	889,017

In addition to the coal consumed for pumping, 53,970 pounds were used for pipe laying, stoves, etc., etc., making a total of $654\frac{850}{2000}$ tons consumed for all purposes, for the quarter ending March 31st.

The coal remaining on hand April 1st, amounts to $173\frac{590}{2000}$ tons.

A detailed list of property remaining at the pumping works is herewith appended.

THE WORK SHOP

Alluded to in your last Annual Report was brought into use in the month of April last.

A portion of the north coal house formerly used for a carpenter shop, was arranged with the necessary shafting, etc., for the "machine shop," a shop 16×24 was built adjoining, which is used for blacksmiths, etc. The tools employed are not of a character to admit doing all work required of them with facility, yet as you anticipated, the establishment of the shop has proved to be a source of both convenience and profit to the city.

The following will exhibit the character and value of the work turned out the past year. The valuation is the same as formerly paid for the corresponding articles, except the iron fence which is estimated.

325 feet Wrought Iron Fence, at	$5	per foot,	$1,625.00
54 New Fire Hydrants,	35	"	1,890.00
42 4 inch Stop Valves,	25	"	1,050.00
28 6 " " "	35	"	980.00
5 8 " " "	50	"	250.00
1 12 " " "	70	"	70.00
Iron Footwalk for Engine House,			239.17
Repairs done for sundry City Departments,			716.81
Total value,			$6,820.98

The expenditures for the past year were as follows:

For Shops, Tools, etc.,	$1,746.09
" Labor and material in foregoing work,	4,560.76
" Raw material on hand,	319.16
Total expenditures,	$6,626.01

The cost of labor and material in the manufacture of hydrants, fence, stop valves, etc., is	$4,560.76
Add interest on shop and tools at 8 per cent,	139.69
" for depreciation of shop and tools at 10 per cent.,	174.61
Total cost,	$4,875.06
Showing a balance in favor of the city of	$1,945.92

In addition to the raw material there is remaining on hand,

10 4 inch Stop Valves, complete.
9 6 " " " "
3 8 " " " "
1 12 " " " "

Respectfully,

DeWITT C. CREGIER,
Engineer.

DISTRIBUTING PIPES

Have been laid to January 1, 1863, as follows, viz.:

SOUTH DIVISION.

ON WHAT STREETS.	BETWEEN WHAT STREETS.	Diameter of Pipe.	No. of ft.
Indiana Avenue......	North street, northward	6 inch.	208
Clark...............	Liberty and Archer Road	8 "	3,253
New.................	Clark, eastward...................	6 "	42
Old	Clark, eastward...................	6 "	44
Old	Arnold and the River..............	4 "	829
Grove	Archer Road and South	6 "	1,136
Grove	South, northward..................	4 "	100
South	Archer Road and Grove	6 "	1,144
McGlashun	South, southward	4 "	53
Archer Road	Grove and Halsted	6 "	1,831
Archer Road	Grove & Halsted (wrought iron siphon)	9 "	90
Halsted	Archer Road and South Branch.....	4 "	450
Palo Alto	Cottage Grove and Calumet Avenues.	4 "	916
Alley rear Park Row.	Michigan Avenue and the Lake.....	4 "	336
Street east Mich. Av..	Alley rear of Park Row and Twelfth.	4 "	91
Prairie Avenue	Monterey and Buena Vista	4 "	440
Monterey	Cottage Grove and Prairie Avenues..	4 "	208
	Hydrants	4 "	255
	TOTAL	....	11,426

WEST DIVISION.

ON WHAT STREETS.	BETWEEN WHAT STREETS.	Diameter of Pipe.	No. of ft.
Rucker	Kinzie and Fourth	6 inch.	1,214
Indiana	Rucker and westward of Elizabeth	4 "	507
Hunt	Rucker and westward	4 "	276
Kinzie	Rucker and Elizabeth	4 "	443
Halsted	Dussold and Polk	6 "	1,969
Ewing	Halsted and eastward	4 "	17
Taylor	Halsted and westward	6 "	393
Canal	Meagher and Canal Port Avenue	6 "	1,032
Mitchell	Union and Jefferson	4 "	800
Union	Liberty and Barber	4 "	549
Union	Twelfth and southward	4 "	55
Jefferson	Mitchell and Kramer	6 "	672
Twelfth	Halsted and Union	8 "	518
Newberry	Twelfth and Taylor	4 "	705
Kramer	Jefferson and Halsted	4 "	1,290
Seward	Canal Port Avenue and northward	4 "	385
Canal Port Avenue	Canal and Seward	6 "	307
North	Canal and Jefferson	6 "	518
Barber	Canal and Halsted	4 "	1,844
West Water	Cook and northward	4 "	74
Forquer	Jefferson and Blue Island Avenue	4 "	2,109
Dupuyster	Desplaines and westward	4 "	454
Paulina	Washington and southward	4 "	126
West Washington	Warren and Union Park	4 "	434
Park Avenue	Paulina and Union Park	4 "	396
Pearl	Third and northward	4 "	269
Prairie	Green and Halsted	4 "	341
Polk	Rucker and Morgan	6 "	1,551
May	Polk and Gurley	4 "	434
Gurley	May and Aberdeen	4 "	150
Margaret	Randolph and Washington	4 "	466
Rucker	Adams and Jackson	6 "	261
West Indiana	Union and Desplaines	4 "	321
Taylor	Jefferson and Halsted	4 "	1,295
Peoria	Randolph and Lake	4 "	255
Wright	Canal and Stewart Avenue	4 "	548
For Dole's Elevator	Canal and South Branch	4 "	1,513
For Union Elevator	Stewart Avenue and South Branch	4 "	674
South Side Union Park	Washington and Reuben	4 "	775
	Hydrants	4 "	331
	TOTAL		26,271

NORTH DIVISION.

ON WHAT STREETS.	BETWEEN WHAT STREETS.	Diameter of Pipe.	No. of ft.
Dearborn	Division and Church	4 inch.	1,397
West Clybourne Ave..	Clybourne Avenue and North Branch	6 "	1,527
Church	North Avenue and Menomonee.....	4 "	2,000
Green Bay Road	Asylum and Franklin..............	4 "	1,290
Franklin	Green Bay Road and Wisconsin.....	4 "	819
Wisconsin...........	Franklin and Sedgwick	4 "	180
Southport Avenue....	W. Clybourne and Clybourne Aves...	4 "	1,345
Clybourne Avenue ...	Southport Ave. and North Reuben..	4 "	1,880
Hickory......... ...	Green Bay Road, eastward	4 "	129
Larrabee............	North Avenue, northward..........	6 "	1,220
Willow	Larrabee and Orchard	4 "	660
Elm	Clark and Larrabee...............	4 "	417
Clark...............	Elm, northward	6 "	50
Asylum Place........	Green Bay Road, westward.........	6 "	30
	Hydrants	4 "	240
	TOTAL..................		13,184

Totals for 1862 and first quarter of 1863, 90 ft. 9 in., 3,771 ft. 8 in., 15,149 ft. 6 in., and 31,871 ft. 4 in.

The total length of pipe of different sizes *in the city*, as near as can be ascertained, is as follows, viz.:

24	inch	cast iron main pipe	12,265 feet.
16	"	" " " "	10,610 "
12	"	" " " "	9,830 "
30	"	wrought iron river pipe, State street.......	280 "
24	"	" " " " Chicago avenue..	236 "
24	"	" " " " Rush street.......	530 "
12	"	" " " " Adams street	176 "
12	"	cast iron distributing pipe	364 "
10	"	" " " "	7,862 "
9	"	wrought iron distributing and siphon pipe, Archer Road	90 "
8	"	cast iron distributing pipe................	37,352 "
6	"	" " " "	173,670 "
4	"	" " " "	270,357 "
3	"	" " " "	30,388 "
			554,010 "

Or, 104 miles and 4,890 feet, not including 989 feet of 4 inch pipe laid in 1862 for three different railroad companies, at their own request and cost, and mostly on their own premises.

HYDRANTS.

During the year the following new hydrants have been put in, viz.:

SOUTH DIVISION.

1 Cregier, N. E. corner Clark and Springer.
1 “ N. E. “ Clark and North.
1 “ N. E. “ Clark and Old.
1 “ N. E. “ Clark and New.
1 “ N. E. “ Archer Road and Halsted.
1 “ S. W. “ South and Grove.
1 “ N. W. “ Archer Road and Grove.
1 “ N. W. “ South and Stewart avenue.
1 “ S. W. “ Cottage Grove ave. and Buena Vista.
1 “ N. W. “ Lake and Wabash avenue.
1 “ N. E. “ Old and Grove.

WEST DIVISION.

1 Hamilton, N. W. cor. Rucker and Fourth.
1 “ N. W. cor. Rucker and Hubbard.
1 “ S. W. cor. Canal and North.
1 “ N. side Mitchell, bet. Jefferson and Union.
1 “ S. W. cor. Twelfth and Union.
1 “ S. W. cor. Halsted and DeKoven.
1 “ S. W. cor. Halsted and Forquer.
1 “ Kramer, north side, east of Union street.
1 “ N. W. cor. Jefferson and Kramer.
1 “ N. W. cor. Canal and Canal Port avenue.
1 Cregier, N. E. cor. Polk and Aberdeen.
1 “ N. E. cor. Polk and Rucker.
1 “ N. E. cor. May and Gurley.
1 “ N. W. cor. Taylor and Union (extended.)
1 “ N. W. cor. Taylor and Desplaines.
1 “ N. E. cor. Washington and Sheldon.
1 “ S. E. cor. Randolph and Ada.
1 “ N. W. cor. Washington and Clinton.

NORTH DIVISION.

1	New York,	W. side Dearborn, line of Goethe.
1	"	N. W. corner Dearborn and Church.
1	"	N. E. " W. Clybourne and Southport aves.
1	Hamilton,	W. side Church, bet. North ave. and Linden.
1	Cregier,	W. side Church, bet. Linden and Menomonee.
1	"	W. side Church, bet. Menomonee and Wisconsin.
1	"	N. W. corner Franklin and Center.
1	"	N. W. " Green Bay Road and Sophia.
1	"	N. W. " Larrabee and Willow.
1	"	S. W. " Clybourne ave. and North Reuben.
1	"	N. W. " Green Bay Road and Asylum Place.

In all, 40. The total number in the city, as reported Jan. 1, 1862, was 469; but as the one at the N. W. cor. of Wilson st. and Stewart avenue was taken out and discontinued in 1862, *the total number* in the city, at this time, is 508, not including 9 put in for railroad and gas companies, on their own premises, and at their own cost.

Twenty-one hydrants were taken out and renewed—2 by Hamilton's, and 19 by Cregier's. Besides these, 45 hydrants received more or less repairs.

It will be seen from the foregoing that of the hydrants now established in this city, 45 are Cregier's. While no particular merit is claimed for the working part of this hydrant over that of several other kinds, it, however, possesses in its supplementary valve a most decided advantage over others, especially in a city like ours, where the stop-cock districts are so large. By closing the supplementary valve, the upper or working part of the hydrant can be taken out for repairs or renewals, without depriving any one in the district of water for a moment.

In consequence of the scarcity of good masons and laborers last year, and the urgent necessity of doing other kinds of work, much less was done than should have been in connecting the hydrants by means of drains with the sewers.

STOP-COCKS.

The following stop-cocks have been put in during the year:

SOUTH DIVISION.

1 New York 4 in., Indiana av. at C., B. & Q. R. R. round-house.
1 W. Wks. shop 4 in., Tremont House alley, for Tremont House.
1 " 8 in., Clark, south side of North.
1 " 6 in., " " " " Cross.
1 " 4 in., " " " " Old.
1 " 4 in., " " " " New.
1 " 4 in., McGlashun, south side of South.
1 " 6 in., Grove, " " " "
1 " 6 in., E. side Ogden's slip on Archer Rd.
1 " 6 in., W. " " " " "
1 " 4 in., W. " " " " " Blow-off.
1 W. Wks. shop 4 in., Tremont alley, bet. Franklin and Wells, Blow-off.
1 W. Wks. shop 4 in., Tremont alley, bet. Franklin and Market, Blow-off.
1 W. Wks. shop 4 in., Quincy, bet. Clark and State, Blow-off.
1 " 4 in., Prairie avenue and Monterey.
1 " 4 in., Arnold and North.

WEST DIVISION.

1 W. Wks. shop 4 in., Halsted, south side of Twelfth.
1 " 4 in., Forquer, west side of Halsted.
1 " 6 in., Taylor, west side of Halsted.
1 " 6 in., Halsted, south side of Polk.
1 " 4 in., Union, south side of Twelfth.
1 " 4 in., Prairie, west side of Halsted.
1 " 6 in., Rucker, south side of Adams.
1 " 4 in., Canal, south side of Monroe, for P. & Ft. W. R. R. Co.
1 W. Wks. shop 4 in., Peoria, north side of Randolph.
1 " 4 in., E. side of Canal, bet. North and Meagher.

NORTH DIVISION.

1 New York 4 in., Chicago av., at Lill & Diversey's Brewery.
1 W. Wks. shop 4 in., W. Clybourne av., at Wicker's Distillery.
1 " 4 in., Church, north side of North avenue.
1 " 4 in., Franklin, north side of Center.
1 " 4 in., Southport av., north side of W. Clybourne avenue.
1 W. Wks. shop 6 in., Larrabee, north side of North avenue.

In all, 32; and, together with those previously put in, making a total of 253 in the city.

Nine stop-cocks were repaired, and 27 were entirely renewed by others made at the Water Works shop, making the total number of stop-cocks made at our own shop, and in actual use on the 1st day of April, 1863, 57 — of which 2 are 8 in., 17 are 6 in., and 38 are 4 in.

WORK SHOP.

The benefits of the work shop have been fully as great as were anticipated at the date of the last Annual Report. The work is not only done when it is wanted, and in the best manner, but an actual saving has been effected in its cost, fully sufficient to justify the outlay made in fitting up. The details will be found in Mr. Cregier's report above.

RESERVOIRS.

During the year 1862 the three reservoirs were all in uninterrupted use, except for about a day with each, when it was necessary to cleanse them.

The south reservoir continued to leak so much as to render further repairs necessary. These repairs have been made for a short time, and appear to be effectual. They consist in five coatings of roofing composition, and four of felting, on the bottom of the reservoir. Over this a layer of three inches of concrete was carefully placed. The bottom of the reservoir was thoroughly keyed up on the beams and other supports. Of course it is too soon yet to judge of the durability of these repairs, but their success so far is very encouraging.

The north reservoir is in very good order. The west one leaks more than it did a year ago, but not sufficient to do any injury yet; it should, however, be calked in the spring.

A few hundred dollars expended in improving the grounds around these reservoirs would add very much to their external appearance.

QUALITY OF THE WATER.

The quality of the water has been bad several times since the date of the last report. At the breaking up of the ice last spring, the discharge from the river was accompanied by a southerly wind, and was carried in front of the pumping works. The taste of the water for several days was exceedingly disagreeable. During the summer, complaints of bad water were comparatively few. In the autumn, soon after the packing season commenced, the offensive state of the river returned, and the water supplied to the city was evidently affected by it during protracted southerly winds. Since the Calumet feeder has been discharged into the canal, and thence into the South Branch, the river has been far less offensive than before, and complaints of bad water have been rare. Perhaps this exemption from annoyance for so long a time has been owing more to the great amount of rain and melted snow discharged into the branches of the river than to any other cause.

The "*fish nuisance*" has been entirely abated since December, by means of the new inlet house, constructed for that purpose. By constantly watching, and daily cleansing the screens in this house, it is believed we may continue to enjoy exemption from what was so offensive a year ago. There is no diminution of the fish, however, outside of the screens; for they appear sometimes to be more numerous than ever.

PLANS FOR GETTING BETTER WATER.

The evil with regard to the water has become such as to demand some remedy, as soon as an adequate one can be applied. The various schemes that have been proposed to effect this object having been discussed in previous reports, it is not thought necessary to go into detail now concerning any of them, except those which are to take the water from about two miles east of the pumping works, where the lake is supposed never to be affected by impurities from the river; or from a point about five miles northward on the lake shore, where impurities from the river very rarely have any perceptible influence.

Other projects, such as erecting new pumping works at Winnetka, or going to Crystal Lake and bringing a supply thence by simple gravitation, as is done for the cities of New York, Boston, Baltimore, and Albany, have been considered, but their great cost, as compared with that of obtaining an abundant supply of good and wholesome water at points much nearer the city, is deemed a sufficient apology for not discussing their details here.

The cost of iron pipes alone to Winnetka, according to the estimate on page 34 of the report of the late Water Commissioners, dated Jan. 1, 1861, would be $1,689,600; but if the present high prices of iron should continue, this amount would be insufficient.

The cost of iron pipes to Crystal Lake, supposing the size the same as proposed to Winnetka, three feet diameter, would be upwards of $5,000,000. Suppose, however, by expending $500,000 at present for a reservoir that might be sufficient for a few years, the second line of pipe might be omitted for eight or ten years, there would remain the necessity for a present expenditure of more than $3,000,000 for items that do not include land and water rights, and the expensive excavation that would be necessary in getting out of the basin of the lake. At the end of a few years, probably not more than ten, the second line of pipe would be necessary, involving an expenditure of nearly $3,000,000 more.

Of the plans proposed for obtaining water from the lake, where it will be free from not only the wash of the shore, but from the effects of the river, two classes only have been considered: one, an *iron pipe with flexible joints;* and the other, *a tunnel under the bottom of the lake.* A great many suggestions have been made with regard to the kind of iron pipe that should be adopted, and the mode of laying it; but the one considered and estimated upon in the report of the late Water Commissioners, for January 1, 1861,—see pp. 26 to 32—may be regarded as a type of the whole, at least as economical as any. In the report mentioned, the suggestion was to extend a pipe but one mile into the lake; but observations made last winter and spring show that the water for the city should be taken from a point *two* miles out; because the bad taste was found at one time to extend about a mile from the shore, and therefore to be out of the reach of danger, a point two miles out should be attained.

It should be here stated that actual observations since 1861, show that the following opinion expressed in the report for the 1st of January of that year, was not correct: "Impurities from the river would be more likely to affect the water a mile out from the pumping station than near the shore, because the prevailing winds are from the north-east, and the currents of this side of the lake strongly southward, as the character of the newly formed beach north of the pier shows." I was led into this error by a study of the formation of the beaches and bars in front of the city. Since, however, there has been an opportunity of studying the offensive discharges from the river as they occurred about a year ago, on so large a scale, it has been ascertained that they mingle so completely with the lake as to be scarcely traceable a mile out, and are carried northward or southward, parallel with the shore, according to the direction of the wind or current in the lake. Generally, discharges from the river are accompanied by southerly winds, and consequently by a northerly current in the lake. The winds and currents, however, are not always in the same direction, as was noticed by some of the earliest French missionaries to this part of the country, much to their surprise.

Estimating then for a pipe two miles long, and allowing for the different items the present prices for materials and labor, the cost would probably be as follows:

10,560 lineal feet of pipe, weight 184 lbs. per foot, or 1,943,040 lbs., at 10 cents, - - -	$194,304
10 joints at $300, - - - - - - -	3,000
Bulkhead, - - - - - - - - -	2,250
Laying the pipe, - - - - - - -	15,000
	$214,554

Thus far the items are those of the gentleman who proposed the pipe, except that the prices have been changed to suit the present state of things, and the length of the pipe doubled, for reasons already given. For reasons mentioned in the report for January 1, 1861, a liberal addition should be made to the above estimate for unforseen contingencies, so that if it should be increased to $250,000, it might then be considered moderate. In consequence of the possibility of such a pipe being injured, by anchors, by the sinking of a heavily loaded vessel over it, or by the effect of an unusual current in the lake moving it from its place, it has been thought preferable to attempt the construction of a tunnel under the bottom of the lake.

LAKE TUNNEL.

The subject of tunneling under the lake to a point two miles out, has received much consideration from the fact that it would not only furnish equally as good water as the pipe would, but could probably be more easily made, considering the circumstances, than is generally supposed.

It is known from artesian borings on the lake shore, at Lill & Diversey's brewery, that about 20 feet below the surface, a clay formation commences which continues upwards of 100 feet further. The bottom of the lake, where the water is more than 25 feet deep, is clay. Should this clay be continuous, and free from beds of sand, it would be very easy to make a tunnel large enough to supply the city for many years.

In order to make such a tunnel, it would be necessary to sink several shafts in the lake. The probability is that four would be sufficient to insure the completion of the work in two years from the time of its commencement. It is proposed to do this by sinking octagonal cribs 80 feet in diameter, with central spaces 30 feet in diameter, leaving an average of 25 feet thickness to the crib around the shaft. In the central space, protected by the crib from the action of the waves, it is proposed to sink iron cylinders 9 feet in diameter, by the pneumatic process which has been so successfully practiced in driving the hollow cast iron piles or piers for the Theiss bridge in Hungary, and the railroad bridge across the Savannah river, near Savannah, in this country, and recently the Harlem bridge in New York. The outmost shaft would be constructed with reference to its becoming the inlet for the water or gate chamber, and perhaps be surmounted with a small light house. The other shafts might either be surmounted with light houses, or be removed, together with their surrounding cribs, to such a depth as not to interfere with navigation. They could be constructed with reference to such a removal, and to a restoration, should future necessities require it.

Such being the outline of the tunnel project, before entering into its details, it may be well to consider some of the objections that naturally arise on the first presentation of the subject. Those who have become at all acquainted with works of this kind, at once think of the Thames tunnel, of the appalling difficulties encountered, and the enormous expense incurred in its construction. A careful study, however, of certain well known facts in relation to that extraordinary work, will furnish us with much more encouragement than would at first be supposed. That tunnel required an excavation 38 feet wide, perfectly flat on top, through an unusually treacherous soil, and only about 14 feet below the bottom of the river, which at high tide was about 32 feet deep, while ours would require an excavation but 6½ to 7 feet, circular in form, through a soil much more favorable, as we have strong reason to believe, and at a depth of 10, 20, 30 or more feet below the bottom of the lake as may be found advisable after sinking the shafts and making experimental drifts. Each running foot of the Thames tunnel cost an average of a little less than $1,900. The sectional area of the Thames tunnel, including masonry and excavation, is about twenty-three times as large as a 5 foot one here would be. As experience shows that small tunnels in troublesome earthy soils do not generally cost any more in proportion to their sectional areas than large ones, if as much, ours estimated on the basis of the Thames tunnel ought not to cost more than $83 a running foot, or for two miles, $876,480, a sum which certainly would not appear unreasonably large, provided an equally good supply could not be got for much less.

Previous to the commencement of the present Thames tunnel, an experimental drift 5 feet high, 3 feet wide on the bottom, and 2½ feet on top, was excavated 1,000 feet in length in the same locality, under the river, and was carried forward from 4 to 10 feet a day by one digger only. It was not made entirely across the river, in consequence of the immense quantity of water that came in at the point where they stopped. The formation of the bed of the river there is composed of eight different layers of sand, gravel, mud, clay, shells, etc., the layers of sand and gravel predominating in depth. If, as we have every reason to believe, the clay formation here would shield us from such inroads of water as were met with in the Thames tunnel operations, and we take the results of the trial drift there for a guide, a tunnel 5 feet in diameter and two miles long could be constructed for less than $300,000.

Another objection which presents itself to the construction of a tunnel here, is the difficulty to be met with in the sinking and maintaining of the cribs, and consequently of constructing and preserving in working order the shafts in the lake. This objection, if past experience here with regard to lake operations for the Water Works is taken as a guide, is by no means a trifling one. The unsuccessful attempts heretofore to sink and put into place a short piece of pipe on the lake shore, have a very discouraging effect when it is proposed to attempt the same thing on a much larger and more difficult scale. But as the question now is relative to the sinking and maintaining of the proposed cribs, we must look to other sources than our own for experience and instruction. Fortunately, there is a large amount near at hand. The extensive operations of the national government in the construction of piers and breakwaters on the lakes, as described in the reports of Col. J. D. Graham, and the miles of breakwater constructed and maintained by the Illinois Central Railroad Company along our city front, furnish us with very satisfactory evidence that such structures can be erected and maintained along our lake shore, and at known prices. The opinion of experienced men is that a circular crib with nearly perpendicular sides and a base sufficiently large, could be made to stand more easily out in deep water than in shallow water near the shore. The reason for this is very plain, as one or two well known facts will show. In deep water, while the form of the wave moves in the direction the wind started it, the water itself has no motion except up and down, as may be seen by the movements of vessels and aquatic birds on the waves; but as you approach the shore or shallow water, not only the forms of the waves, but the water itself has a forward motion, the shallower the more rapid; hence the great danger of a vessel approaching too near such places in stormy weather.

It is proposed to construct the cribs in still water, plank their bottoms and sides, water-tight, for several feet up, fill them with as much stone as they can safely carry, then tow them when the surface of the lake is quiet to their places and sink them, by letting water into their bottoms, and then to fill them up, as promptly as possible, to their tops with stones previously provided.

The pneumatic process for sinking the shafts is recommended, because it is believed the operation could thus be more certainly performed, and troublesome leakage more easily avoided, than by constructing coffer-dams inside of the cribs. But by either process the end could no doubt be attained if, as soundings already show, the bottom of the lake is [hard] clay.

A diameter of only 5 feet has been suggested for the tunnel, partly to make it in capacity just equal to the proposed flexible pipe, and partly to avoid the risks and uncertainties attending the construction of larger tunnels in troublesome earthy soils. This latter point cannot be better illustrated than by quoting the language of M. Minard in his work on construction. After speaking of the great difficulties met with in constructing several large tunnels, and pointing out the methods by which they were overcome, M. Minard says (pp. 284, 285):

"The success of the general processes just pointed out, principally the lateral drift, is based, I repeat, upon the great difference there is between making a drift 4¼ feet or 4$\frac{6}{7}$ feet in width and opening a tunnel of several yards; numerous experiments prove this difference."

"In the clay of Vaurigard, drifts were made which stood well so long as they had a width of not more than 4¼ feet."

"When the small feeder tunnel of Torcy was commenced in detached masses of sandstone of moderate size, it was very easy to give it a width of 5¼ feet, but when the attempt was made to increase this width to 8½ feet, masses were detached, the supports bent and broke, and caves extending 65 to 80 feet occurred."

"In the chalk, full of fissures, at Saint Quentin, drifts 4¾ feet were easily excavated, without supports, where it was impossible to give them a width of 10 feet."

"In the clay of Roubaix, a number of drifts were made, 6½ feet in width; but this dimension could be exceeded but slightly without exposure to serious accidents."

In estimating the probable cost of such a tunnel various items must be assumed, for the prices of labor and materials are seldom the same exactly during two consecutive seasons, in fact they often change materially in one. The character of the soil through which the tunnel is to be made, as it regards the difficulties to be overcome, can only be fully ascertained by the actual carrying out of the work, though much may no doubt be ascertained by preliminary borings.

There is good reason to believe that nothing in the soil here would be more difficult than that through which the sewers of London are sometimes tunneled. M. Bazalgette, the Engineer of the Metropolitan Board of Works, in 1856, estimated the excavation of tunnels for sewers to cost on an average, including all expenses of raising the earth to the surface and carting away the surplus, supporting the top and sides till the masonry was built, and restoring water and gas pipes and paving, at three English shillings, or say 75 cents, a cubic yard. The same year he estimated for several much larger tunnels in the same city at twice the rate, or say $1.50 per cubic yard. These estimates are based upon the actual experience of a city which has probably had more to do with this kind of work than any other city in the world. But, to allow for our extra hauling underground, the proposed average in the tunnel being an eighth of a mile, and taking into account the difference of prices in the two countries, the cost per cubic yard for our tunnel will be estimated at $3.

The cost for brick masonry per cubic yard, in the English sewer tunnels appears to average from $5.58 to $6.75. In the tunnels on the Boston Water Works it averaged $14.57. In the estimated cost of 1861 for the proposed tunnel here, $15 per cubic yard was allowed for this item; but as that was for a 6 foot opening, with 12 inches in thickness of masonry around it, and this is only 5 feet opening with 8 inches of masonry around, and as prices of labor and materials may continue high, $20 per cubic yard will be allowed in the present estimate.

The next item to be considered is the cribs. It is evident that an octagonal crib 80 feet in outside diameter, with a central space of 30 feet, leaving the solid portion 25 feet thick, would be very much stronger, and better calculated to resist the action of storms, than cribs of the same width and construction placed in a straight line; but it is proposed to construct ours in the same manner as those of the government.

Col. Graham estimated the cost of a crib 30 feet long, 30 feet wide, and 32 feet high, (for the proposed breakwater at Michigan City,) p. 352 of his report for 1856, as follows, viz.:

"For 6,210 lineal feet of white oak timber, hewn, one foot square, at 22 cents per lineal foot,	$1,366.20
"For 2,160 feet, board measure, of white oak plank, 3 inches thick, for flooring, at $20 per M,	43.20
"For 8,060 pounds of round wrought iron, for bolts, 1½ inches diameter, at 4 cents per pound,	322.40
"For 164 pounds of wrought iron spikes, ⅜ by ⅜ inches square, pointed and headed, at 7½ cents per pound,	12.30
"For 176 cords of hard boulder stone, for crib ballast, at $10 per cord,	1,760.00
"Estimated cost of materials for one crib,	$3,504.10
"For carpentry, labor, superintendence, etc.,	1,250.00
"Add 10 per cent. for contingencies,	475.40
"Estimated cost of one crib,	$5,229.50"

Which, for 28,800 cubic feet, would be $18\frac{16}{100}$ cents, very nearly, per cubic foot.

By examining Col. Graham's prices, it will be seen that they are for all the important items, quite equal to those of the present day; but for safety about 21 per cent. will be added to all his prices, making the estimated cost 22 cents per cubic foot.

The shafts come next in order. These it is proposed to make of air-tight wrought or cast iron cylinders, jointed together in sections of 6 to 10 feet, and 9 feet in diameter. They are to be sunk by the pneumatic process, which consists in exhausting the air from them to sink them, and in compressing the air sufficiently within them afterwards to force the water entirely out of them through syphons, thus allowing excavation and other kinds of work to be performed in them. It would of course require a small steam engine, air pumps and chambers, pipes, valves and other kinds of apparatus, to perform the process, all of which will be found described, with accompanying drawings, in the July, August, September and October numbers of the *Journal of the Franklin Institute*, in an article from the French of M. Cezanne, translated by Jos. Bennett. An examination of this article suggests but one item of more than ordinary expense, and that is the slowness with which such a cylinder sinks in clay; but this would require only an increased expenditure of steam power, a small matter compared with the whole expense of the shaft; while on the other hand the freedom from tidal and river currents we should have, and the spacious and solid platform the cribs would afford for the different operations, would be of great advantage; while the very slowness with which the cylinder would descend into the clay, would make it so much the easier to keep it plumb, a serious difficulty sometimes encountered in loose sand.

The estimate for the cylinders will be for cast iron, 9 feet in diameter, and 1½ inches thick, although wrought iron of sufficient strength could probably be made for less. The cylinders, including flanges, would weigh 1,650 pounds per lineal foot, for which, delivered and put together on the cribs, 6 cents per pound is believed to be ample. This would be $99—say $100 per foot.

The cost of apparatus for sinking at the Theiss bridge, was $5,640; for ours, it will be called $10,000. The cost of filling the twelve cylinders of that bridge with beton (concrete), was $8,132. This operation required important expenditures, which we should not need here for the sinking of our cylinders, but it also left out some others. For the sinking of our cylinders, $10,000 will be allowed—that is, $2,500 for each, while the above statement for the Theiss bridge makes only $761 each. These appear to have been sunk upwards of 20 feet.*

According to the new city charter, it would be necessary to furnish and maintain beacon lights at the piles or cribs. There are several strong reasons why it would be better to remove the cribs and shafts after the completion of the tunnel to a depth sufficient to avoid all dangers to navigation. These are:

---

* Since the date of this report, a visit has been made to the Harlem bridge, on Third Avenue, New York. The iron piles of this bridge are mostly 6 feet in diameter. Four of them are 8 feet in diameter. The greatest depth of the river there at high tide is 28 feet. The greatest depth to which any pile was sunk, was 35 feet. The soil at the bottom was generally mud, but layers of very hard gravel and earth, requiring the use of picks and bars, were met with. They found some boulders a cubic yard in size, and in one case went through the wreck of a sunken canal boat. The tide produced a very rapid and troublesome current. The result of their experience shows that our estimates are abundantly large.

1st. The saving of the cost of construction and maintaining the light houses.

2nd. The avoidance of questions of damages between the city and owners of vessels or cargoes, should any be lost or injured by coming in contact with the light houses or cribs.

3rd. Avoiding the possibility of injury to the shafts from the shock of large masses of ice. This is looked upon as imaginary by most persons, but it seems possible.

In case it should be deemed best to build one or more light houses, an additional sum must be added to the estimate for them. One light house at the outmost shaft would possess the advantage of enabling the city, by means of one or more inlet gates, to shut off the water from the tunnel at any time, either for the purpose of repairing or cleansing it. If the work should be properly done, no repairs would be needed for hundreds of years; and the comparatively short time in the year when there is any turbidity in the water of the lake two miles out, would render the necessity of entering the tunnel to cleanse it, of exceedingly rare occurrence. It is possible that the growth of shell fish and aquatic plants might obstruct it seriously after a good many years. Should such a necessity as this or any other arise for entering the tunnel, it is very easy to devise mechanical expedients, which, if provided for in the first construction of the work, could readily be used for shutting off the water.

The estimated cost of the lake tunnel would be, leaving out the light houses:

16,000 cub. yards excavation, at $3 per yard, - -	$48,000
4,750 cub. yards masonry, (including landshaft) at $20,	95,000
561,600 cub. feet of cribs, at $22, - - - -	123,552
Cylinders 210 lineal feet, and apparatus for and sinking of shafts, - - - - - - - -	41,000
	$307,552

It will be seen in the above estimate that the probable cost of the masonry and excavation in the proposed lake tunnel is $143,000, or $13.54 per lineal foot. This amount will no doubt strike many as being very low, notwithstanding what has already been said about the prices per cubic yard for this kind of work.

Perhaps, to such persons, the large amount of very valuable information obtained by the commissioners upon the Troy and Greenfield Railroad, and the Hoosac tunnel, and published in their report of February 28, 1863, may afford some assurance. The commissioners, for the purpose of better enabling them to perform their duties relative to the Hoosac tunnel, sent Mr. Charles S. Storrow, so well known in the East for his high qualifications for such a mission, to Europe, to obtain by personal examination or otherwise, all the information he could, having any important bearing on the subjects they were to report upon.

The Hoosac tunnel being designed for a railroad, of course Mr. Storrow paid no attention to such as were intended for a purpose like ours, and especially to those of so small a size. Nevertheless, the information he did obtain relative to tunnels constructed through earthy, and in some cases very difficult soils, will, when the rule of proportional sectional areas, (or rate per cubic yard, including both excavation and masonry) is applied, show that our estimate of cost exceeds by a large per centage, the actual cost of the most expensive tunnel he mentions; as the following tabular statement, compiled from Storrow's report and Minard's work, will show:

NAMES.	Length in feet.	Greatest width in feet.	Cost per lin. foot in dollars and cents.	Character of Soil.	Estimated cost per lin. foot of a five foot tunnel, at same rate per cubic yard.
FROM STORROW.					
Lindal, England	1,689	12	$ 25.83½	Rock and loose material.	$4.49
Sydenham, England	6,300	24.50	200.00	London clay	8.33
Chezy, France	1,388	24.27	139.00	Sand and clay	5.90
Foug, "	3,681	24.27	83.33	Oxford clay	3.54
St. Cloud, France	1,653	24.27	133.00	Marl, clay and gypsum	5.65
Hardelot, "	603	25	106.67	Clay.	4.27
Belleville, "	3,690	24.92	64.00	Clay and plaster.	2 57
Charonne, "	3,348	24.92	67.00	Wet clay and plaster.	2.69
Alouette, "	4 050	25.58	101 67	Clay	3.89
Boubard, "	1,920	25.91	121.67	Clay and limestone	4.52
Poitiers, "	1.050	26.24	76 67	Lime, sand and clay	2.78
Boissy, "	2,619	25 68	173.00	Clay and marl	6.56
Conches, "	831	25	68.00	Clay and sand	2.72
St. Louis, "	1,560	26.24	94.67	Clay	3.44
FROM MINARD.					
Riqueval, France	18,620	26.27	42.67	Chalk, much water	1.55
Tronquoy, "	3,619	26.27	46.93	Chalk, dry	1.70
Noirieu, "	39,372	4.92	4.27	Chalk, water	4.41
Thames and Medway, England.	11,877	29.53	48.77	Chalk, water.	1.40
Soussey, France	11,552	8.55	14.02	Marl, little water	6.15
Charleroy, "	4,226	14.11	75.59	Running sand, water.	9.50
Kilsby, England	7,231	23.95	207.86	Earth, sand, much water.	9.06
Cumptich, France	3,035	14.11	51.81	Sand and clay, water	6.57

It should be here mentioned that as the exact sectional area of very few of the tunnels above mentioned is given, the deduction as to estimated cost of a 5 foot tunnel, in the last column, was obtained by considering the greatest interior or clear width as the diameter of a circle, and considering the lining of each tunnel, whatever it might be, proportional to the diameter. These assumptions are known to be not strictly true, nevertheless the results obtained are sufficiently accurate to show that actual experience justifies our estimates.

It will be seen by examining the tables that of the twenty tunnels mentioned by Mr. Storrow and M. Minard, which include all that have any similarity of soil to ours, only three exceeded in cost one-half the estimate for ours, and that the cost of the greatest, the Charleroy, was only seventy-one per cent. of our estimate. They were all constructed through a much more difficult soil than we expect to meet with. Mr. Storrow relates some very interesting facts with regard to the London clay met with in the Sydenham tunnel. It has the peculiar property of slowly swelling after it has been exposed to the air, so that the linings of shafts were very much compressed and the invert of the main tunnel had, in some instances, to be rebuilt several times, until at last they had to make the whole lining of the tunnel, including the invert at the troublesome places, nearly or quite circular. Notwithstanding all these difficulties, the average contract price in England for tunneling through London clay is 25 per cent. less than that given in the tabular statement.

LAKE SHORE PROJECTS.

To avoid some of the objections made to the proposed lake tunnel, as well as to the pipe, it has been proposed to bring water from a point on the lake shore about five miles north of the pumping works, where there is a beach admirably adapted for the purposes of a natural filter.

At this point it is believed impurities from the river would very seldom affect the water, and then but slightly compared with our present experience. It has been thought too, that by having a natural filter basin there, 3,000 feet long and 10 feet deep at low water, all the water for the city might be delivered at all times free from sediment, and from unpleasant taste, except upon the rarest occasions. All the light we can obtain, however, from the experience of the Hamilton water works and from several in Europe, shows that natural filters are uncertain in their results and cannot be relied upon to furnish very large amounts unless they are made enormously long. Even then they are liable after a while to lose their efficiency. Dupuit, in his work on the distribution of water, 1854, p. 24, says, "By excavating galleries along certain water courses, a perfectly limpid water has been obtained, from filtration through the beds in contact with these galleries. Now it has happened that some of these have dried up, while the product of others has not diminished, hence some uncertainty with regard to the use of natural filters, and various explanations relative to the phenomenon of filtration."

Should such a filtering basin as the one here proposed fail to filter water enough for the city, as there is much reason to apprehend, it would, nevertheless, be of great service as a subsiding reservoir, by freeing the water from the grosser particles of sand and clay mixed with it along the shore of the lake in rough weather.

Three modes of conveying the water from the filtering basin to the present works present themselves. The *first*, to pump it up about 15 feet into a small reservoir, and then convey it in a brick aqueduct along the swale between the Lake View House and the cemetery, and thence along the lake shore. The *second*, to make a brick aqueduct low enough to avoid the necessity of pumping at the filtering basin, and to follow the same route as the first, making of course a much deeper excavation ; and the *third*, a brick aqueduct as low as the second, but following a route sufficiently far west of the others to admit of a tunnel being made in clay. The *first* of these would undoubtedly be the cheapest in cost of construction, but would be encumbered with the constant and increasing expense of pumping, and would be liable to the objection of passing through the cemetery. The *second* would avoid the necessity of pumping, but not the objection of passing through the cemetery. The *third* would avoid both of these objections.

For the sake of comparison with the pipe and the lake tunnel plans, the estimate for these different modes will be based upon an aqueduct 5 feet in diameter and 8 inches thick, although should either of them be adopted, it is probable an aqueduct of greater size would be constructed.

FIRST MODE.

180,000 cub. yards excavation for filtering basin, at 25 cts.	$45,000
100 acres of land for filtering basin, at $250,	25,000
Inlet to basin and gate house,	15,000
67,320 cub. yards excavation, at 40 cts.,	26,928
9,025 cub. yards masonry, at $12,	108,300
Small reservoir, say	10,000
Land damages, say	10,000
Engines, pump house and fixtures,	25,000
	$265,228

SECOND MODE.

Filtering basin, inlet and gate house,	$85,000
134,640 cub. yards excavation, at 62½ cts.,	84,150
9,025 cub. yards masonry, at $13,	117,125
Land damages, say	10,000
	$296,275

THIRD MODE.

Filtering basin, inlet and gate house,	$85,000
34,700 cub. yards excavation, at $2,	69,400
9,525 cub. yards masonry, at $15,	143,175
Land damages, the line being mostly in highways,	3,000
	$300,575

It will thus be seen that of the three modes proposed for bringing the water along the lake shore, from a point north of the Lake View House, the first mentioned would cost least to construct; but on the supposition that the time would soon arrive when it would cost $5,000 a year to maintain the pumping works there, the first would be more costly than the others, for a constant annual expenditure of $5,000 would be equivalent at 7 per cent. to a permanent investment of $71,428.57; or, at 6 per cent. to $83,333.33. The probability is, that in a few years, Chicago will be able to borrow money at 6 per cent. as easily as the eastern cities do now.

The estimates for the second and third modes amount to so nearly the same, that the difference between them is very unimportant. By the third, passing through the cemetery would be avoided, as well as possibly considerable trouble in settling land damages; besides, the uncertainty as to cost and difficulty from the great quantity of water which will undoubtedly be met with on the second, would probably be much less on the third. On this account, the estimate for the third mode will be used in comparing the different plans proposed.

These plans, and their corresponding estimates, are:

1.	The flexible pipe, two miles out, - - -	$250,000
2.	The tunnel, two miles out, without light houses,	307,552
3.	Lake shore plan, - - - - - -	300,575

If any allowance be made for light houses, the lake tunnel plan will probably be the most expensive, by not less than $50,000.

As the uncertainty with regard to the permanent security of the flexible pipe would be so much greater than that of the tunnel, supposing all the difficulties in placing it in its proper position were overcome, the question for decision will be considered as resting between the lake tunnel and the lake shore plan.

The advantages of the lake tunnel plan are the supply of a much superior quality of water during a considerable portion of the year, and, with the same head, a larger quantity; in other words, the lake tunnel would be capable of delivering into the pumping well, at a level of 2, 8, or 18 feet below the level of the lake, as much water as an aqueduct on the lake shore, of the length proposed, 10 inches larger in diameter, would. The quantities delivered under these different heads would be, respectively, 19,000,000, 38,000,000, and 57,000,000 wine gallons daily.

The advantages of the lake shore plan are, fewer difficulties and uncertainties in the construction and cost of the work, and greater certainty in making repairs and cleansing, should these become necessary. Ought these advantages to outweigh those of the lake tunnel plan? This is a perplexing question. The more it is studied, the more does the feasibility as well as superiority of the lake tunnel plan appear settled to me; but the subject is not free from serious doubts, at least to most minds, and *it is therefore recommended that you invite proposals from respon-*

sible parties for the construction of the work on both plans, and then with the new light thus obtained, decide which to adopt.

THE CONDITION OF THE RIVER.

As the condition of the river has had much to do with the character of the water delivered through the distributing pipes of our city, it may be as proper to speak of it here, as under the head of sewerage; at least so far as that condition and the proposed remedies for it affect the water question.

The experience of the last year has not changed the views previously entertained with regard to the causes of the offensive state of the river during a protracted rainless season, whether in winter or summer; but it has proved the necessity for adopting early and decisive measures for securing permanent exemption from the evils complained of at different times during the last two years.

Last spring the Board employed Dr. Mariner, Assayist of this city, to ascertain if possible the causes of the black appearance of the river about that time. He investigated the subject and reported thereon; but unfortunately his report has been mislaid, and, strange to say, the copy he kept for himself cannot be found. From the best of his and our recollection, his conclusions generally did not differ from those entertained by the Board, as to the sources of impurity in the river; that is, that the sewers, distilleries, slaughter houses, glue factories, etc., etc., *combined*, cause it; and gave as his opinion that the black color of the river proceeded more from the sewer leading from the gas works, than from any other source.

Dr. Mahla, the well known chemist of this city, was employed afterwards by the City Council for a similar purpose. His report has been published in full, in the proceedings of the city council for September 22, 1862, but as in that form it is accessible to very few, his conclusions, the result of his careful and scientific investigations, will be repeated here.

"Thus it appears that the largest portion of the river nuisances is generated on the North Branch, and it must be borne in mind that *not a single sewer* empties into that part of the river.

"It cannot be disguised, however, that the sewers themselves give rise to a certain portion of odorous effluvia, and will do this in a still greater measure in the course of time (a thing which was mentioned in the Sewerage Commissioners' report of 1855). But considering that the sewers, which are of importance, are emptying their liquids into the main branch of the river, so that the sewage has but a short distance to flow until it mixes with lake water, and is largely diluted with it, I do not believe that their effects are for the present specially noxious.

"It may be stated here that all the sewers south of Madison street, with the exception of a single one, are of not much importance, and that the sewage contained in them is but little richer in ammonia than the river water itself. The single sewer, however, to which I have made reference, is Monroe street sewer. The liquid contained in it is very rich in ammonia; contains coaltar-creosote (carbolic acid) and exhales copious quantities of sulphureted hydrogen; a lead paper held in a distance of four or five feet from the surface of the water is blackened almost immediately, provided that the current has a riverward direction. The discoloration of lead paper is effected in a much slighter degree by the sewage of other sewers.

"Admixed to the liquid discharged by the Monroe street sewer are tarry substances which have accumulated in the river to such an extent that its whole bed seems to be covered with it, for every steam tug wheeling up the water makes a portion of tar rise to the surface. The presence of these tarry substances can be traced from Adams street to Rush street bridge. Sulphuric ether agitated with the water extracts them readily; they may be separated from the ethereal solution by a subsequent spontaneous evaporation.

"Sewage in the Rush street sewer appears less charged with ammonia than in other sewers. This may look strange to some, as it is known that the greatest number of privies are connected with it. The water in this sewer is in a condition perfectly different from others. It is hot (heated by the condensing waters of the pumping works and breweries), and hence less apt to hold gaseous bodies in solution. Ammonia and its associates of miasmatic effluvia are therefore sent into the air as soon as generated. Hence this sewer becomes often very offensive to the inhabitants of the street, much more so than Randolph street sewer to the inhabitants of that street.

"From the above it may be seen, that 1st, The greatest portion of the impurities which give rise to putrid effluvia, enter into the North Branch of the Chicago river; that the urine, fœces, etc., from cattle, pigs, etc., fed on the swill of the still-houses, by being allowed to flow into this branch, are the most direct causes of noxious exhalations; that certain distilleries in allowing portions of the swill to run into the river contribute also their share to them.

"2. The Monroe street sewer discharges into the river a liquid which contains odorous substances that are usually produced in gas factories, which are more disagreeable than noxious.

"3. The city sewers alone are not yet of sufficient importance to create serious trouble, but will do so undoubtedly in the course of time.

"4. The slaughter and packing houses on the South Branch cannot be blamed *at present* — a conclusion which may be inferred from the fact that they are not and have not been working for several months previous to the commencement of this investigation. The question whether they do throw waste materials into the river, when working, can be settled only in the spring-time, after the river ice has given way.

"It is undoubtedly a matter of great importance how the existing nuisances can be abated. I cannot omit, however, to make here the remark that not all the odorous effluvia are sent forth by the Chicago river. The packing and slaughter house owners are at present not doing anything which is objectionable or deteriorating to our river water. But, if my information is correct, they leave large quantities of refuse matter in certain places near by, where they undergo putrefaction. The odor in the vicinity of such establishments is unbearable, and, I ask now, is the stench by which Bridgeport is infested, and which can be observed during a favorable wind even in our city business streets, less objectionable because it proceeds directly from the soil on which the animal refuse is thrown, and does not emanate from the river water? Are the gaseous bodies generated by putrefactive process less noxious in the first than in the latter case?

"I should propose that these men, instead of throwing a valuable azotized compound away, should use it up *for the produc-*

tion of saltpetre, which is an article commanding invariably a certain price, that would not only cover expenses, but secure a handsome profit. The same might be done by the owners of the stables and piggeries with the urine and manure. The gas factory, however, instead of pouring the wash water into the river, could use it for the *production of ammonial salts*, a thing which is done in most of the European cities with a great deal of advantage. By doing so, the offensive sulphureted hydrogen could be got rid of in a more complete manner than by using dry lime purifiers."

PLANS FOR IMPROVING THE RIVER.

Various plans have been suggested for freeing the river permanently from offensiveness, all of which may be divided into three classes:

1. Those which would drain the city into the Illinois river.
2. Those which would divert the Des Plaines into the South Branch of the river, and thus keep up a constant current to prevent offensiveness; and
3. Making canals from the lake to the North and South Branches, and driving water enough through them from the lake, to keep the river and branches comparatively pure at all times.

The 1st class is one requiring much larger means than the Board can at present control.

The 2nd class is defective, in that a supply of water from the Des Plaines would be likely to fail when most needed.

The 3rd class is undoubtedly feasible, would be completely under the control of the city, and there is every reason to believe would be effectual.

The proof that this plan would be effectual, will now be stated. The condition of the river a year ago last winter, when there was no rain for so long a time, will be remembered by all who were in the city then. It was never so offensive before for so long a time, and has not been so since. At the breaking up of the ice in the river, by the spring freshet, all the offensive water was discharged into the lake, leaving the river comparatively pure. It was not offensive again, till the approach of warm weather; then it became black and otherwise disgusting; and the only immediate remedy that suggested itself, was to induce the canal trustees to set the pumps at Bridgeport in motion. This was soon done, and its effect at the mouth of the river began to be apparent, but owing to several stoppages in consequence of rains which occurred soon after the pumps started, the only result of the whole operation was to make the South Branch to Bridgeport, and the canal to Lockport, black and offensive, without materially benefiting the main river. Pumping was then entirely stopped, and very soon the South Branch lost its disagreeable color and smell. Not long after this, the City Council stopped in a great measure the commission of nuisances on the North Branch, and the main river recovered a very bearable condition, which it retained till after the commencement of the packing season. Then the offensive smells reappeared in both branches and in the main river, and were perceived at the Water Works. As the amount of cattle and hogs to be killed here during the winter was known to be greater than ever before, it was with great reason feared that the condition of the river and of our drinking water would be more intolerable than ever; but soon after this threatening state of things commenced, the season became unusually mild and rainy, and has continued so ever since. Besides this, by an arrangement between the city government and the canal trustees, the Calumet feeder has been discharged this way, a good portion of the time. Owing to these causes, we have not had such exemption from offensiveness in the river and in drinking water, for several years, as we have had this winter.

The above facts show, that on the recurrence of another protracted rainless season, we may look for a repetition of the evils already suffered; and that an effectual remedy therefor would be a constant current from the river into the lake.

How much of a current would such a remedy require? Probably nothing but actual experience will settle this question, and it is very likely that the amount required will increase as the population and business of the city increase. A fact or two may serve as very useful guides in the first works constructed for this purpose. In the summer of 1861, the river began to be very offensive, and the city government was about to make an arrangement with the Canal Trustees to start the pumps at Bridgeport; but before the agreement could be completed, the trustees had to commence pumping on their own account. From that time till after the commencement of the packing season the river ceased to be a cause of complaint.

Late in the spring of 1862, the same annoyance from the state of the river began to be loudly complained of, when the measures already described were taken. The result, at first so different from that of pumping in 1861, was owing to the quantity of water flowing into the river, which neutralized the effect of pumping so far as to keep the South Branch in a worse state than if there had been no pumping at all; for soon after this ceased, the South Branch lost its dark color and offensive smell, and did not have either again till after the commencement of the packing season.

Now if a quantity of water which the pumps at Bridgeport could raise was sufficient, by moving southward, to keep the main river and the South Branch in a tolerable condition during the summer of 1861; and if the quantity naturally flowing down the South Branch, which for a time the pumps were more than able to keep in check, was sufficient to keep the South Branch, and the main river too, after the distilleries on the North Branch had been restricted in their discharges into it, in a bearable state, in 1862, it is evident that if the same quantity of water could be thrown *into* the South Branch and thus added to the natural current, it would for some years to come be sufficient to keep that branch and the main river in a bearable state, provided the same restrictions upon the distilleries should be continued. The pumps at Bridgeport never worked constantly for several days at a time, and never averaged during any week over two hundred cubic feet per second, because it was found a greater quantity filled the canal so full as to endanger its banks.

It is now proposed to drive from the lake into the river, through a covered canal or aqueduct, 12 feet in diameter, 400 cubic feet per second. This amount would be sufficient in less than twenty-four hours to change all the water in the South Branch and the main river, to its mouth. A head of one and a half feet at the lake would produce the requisite motion in the canal, and a steam engine of 100 horse power would be sufficient to produce the head required. The water may be raised the height proposed, either by a bucket-wheel like those used at Bridgeport, or by a propeller-wheel like those used on the lake boats. Popular opinion appears to be decidedly in favor of the former, but there are reasons in favor of the latter which ought not to be hastily set aside. These are, the equal ease with which a propeller-wheel could be made to drive water backwards or forwards, which the Bridgeport wheel could not do, though a modification of it might; the greater freedom from injury by floating ice or other substances; and the absence of all necessity of adjustment to suit extreme levels in the surface of the lake.

The probable cost of such a canal on North street, engine, wheel and house, would be as follows, viz.:

63,000 cubic yards excavation, including sheeting, bracing and pumping, at 75 cents, - - - -	$47,250
5,300 cubic yards brick masonry, 12 inches thick, at $10,	53,000
Engine house, engine and wheel, - - - - -	35,000
Restoration of sewers, water and gas pipes, - -	4,750
Total, - - - - - -	$140,000

This canal, if constructed, could have no effect in purifying the North Branch, or the South Branch south of North street. Why not then expend what this one would cost towards making one from the lake across to the vicinity of Bridgeport, or one from the lake, north of the city limits, to the North Branch? Either of these canals would be about three times as long as this, and though they might not require to be arched over, would require, if made in open cutting, very flat slopes, and protecting walls to keep them from being filled with quicksand. Besides, railroad, common road and farm bridges would have to be maintained over them, and heavy land damages paid for room for the waste earth. Either one of them would cost very nearly or quite twice as much as the one proposed, and would cost much more to maintain.

Should the National or State government ever construct the contemplated ship canal to the Illinois river, neither of the canals now mentioned would be needed for purifying the South Branch, at least during the season of navigation, and probably not in winter, except when repairs might be needed.

The estimate for the North street canal includes a sufficient depth of cutting to place its bottom sixteen feet below low water. It could then be used as a part of the main outlet of a system of intercepting sewers, should one ever be adopted in this city, to keep the sewage out of the river and branches, and discharge it into the lake. The fact that they are carrying out such systems both in London and Paris, where they have so much skill and experience in matters of drainage, admonishes us that, sooner or later, we may be satisfied that such a system should be carried out here. It is well to keep this subject continually in mind, and fortunately for us, we have done nothing whatever to prevent the adoption of such a system whenever its necessity may become sufficiently apparent. It is equally fortunate that we are likely then to have the actual results of the experience of those great cities.

The reasons for recommending only the North street canal at present may be summed up as follows, viz.:

1st. The amount to be expended would not be more than about one-half of what would be necessary to carry out any other plan. The amount saved at first would, at seven per cent. compound interest, double itself in less than eleven years, so that at the end of that time, should it be necessary to make the longer canal further south, there would be no loss pecuniarily, supposing the North street canal should then become entirely useless.

2nd. The experience gained by the use of the short canal, would undoubtedly be of great value in settling important questions relative to the dimensions required for the longer ones, should they be needed, and to the amount of power and the best kind of apparatus for driving water through them.

3rd. Should the National or State government make the proposed ship canal to the Illinois river, there would be no need of a canal from the lake to the South Branch, south of North street.

4th. Should the developments of a few years more show that our sewage must be kept out of the river altogether, then no canals for driving lake water into the river would be needed. But in order to keep the sewage of the city out of the river, a system of intercepting sewers would have to be made along the river and branches, and discharge into the lake. The North street canal could then be used as part of the main trunk or outlet of such a system.

METERS.

Mr. O. F. Woodford, the water assessor, who has immediate charge of all the meters, reports the following as being now in use:

	20	⅝	inch.
	24	1	"
	16	2	"
	5	3	"
Whole number,	65		

All of which are Worthington's patent.

The favorable results anticipated from their use have been fully realized. The contrivance spoken of in the last annual report, for preventing their stoppage by sand and grit, has proved a perfect success, and is to be used hereafter wherever it may be applicable and needed. In some parts of the city, sand and grit are much less troublesome than in others.

The last annual report of the Cochituate Water Board mentions a wonderful reduction in the consumption of water, equal to an average of about *nine* gallons a day for each inhabitant, and attributable mainly to the use of meters.

SEWERAGE.

In consequence of financial difficulties, less work was done in this department in the early part of last summer than was desirable. The following tabular statements will show what has been done since January 1, 1862; also the whole amount of sewers built up to this time:

Return of Sewers Built in 1862, and to April 1st, 1863, and Repairs of Sewers for same period.

LOCALITY.	CONSTRUCTION.							REPAIRS.		
	6 foot Sewers built.	4½ foot Sewers built.	4 foot Sewers built.	3 foot Sewers built.	2 feet Sewers built.	1 foot Pipe Sewers laid.	No. Catch Basins built.	Lin. ft. Sewers repaired.	No. Catch Basins rep'd.	No. of Man Holes and Catch Basins altered to grade.
SOUTH DISTRICT.	No. ft.	No. ft.	No. ft.	No. ft.	No. ft.	No. ft.				
Ringgold Place, E of Calumet Av	567	....	....	....	....	....	..	....	....	....
Old st. from State st. sewer east	....	....	....	....	....	694	..	....	....	....
La Salle st. Madison to Jackson	....	....	....	....	....	1,381	..	....	....	....
Totals in South District......	567	....	....	....	....	2,075	22	10	43	136
WEST DISTRICT.										
Fulton street, Halsted to Peck..	....	4,572	....	....	....	....	..	....	....	....
Adams st. Halsted to W. Aberd'n	....	2,213	....	....	....	....	..	....	....	....
North st. Canal to Stewart Ave.	....	....	578	....	....	....	..	....	....	....
" " " Jefferson....	....	....	....	818	....	....	..	....	....	....
Canal st., N. from North st....	....	....	....	....	231	....	..	....	....	....
Jefferson st., N. from North st.	....	....	....	....	228	....	..	....	....	....
Centre street	....	....	....	....	....	310	..	....	....	....
Margaret street,.............	....	....	....	....	....	188	..	....	....	....
Totals in West District	....	6,785	578	818	459	498	37	....	39	23
NORTH DISTRICT.										
Green Bay st. Chicago Av. to Div	....	2,721	....	....	....	....	..	....	....	....
Whitney st. G. Bay to Dearborn	....	....	....	....	734	....	..	..	....	....
Legg st., from Pine st. 450ft E.	....	....	....	....	....	450	..	....	....	....
Totals in North District......	....	2,721	....	....	734	450	9	14	55	39
GRAND TOTALS.............	567	9,506	578	818	1,193	3,023	68	24	137	198

LENGTH IN FEET OF SEWERS LAID TO APRIL 1st, 1863.

	SOUTH DISTRICT.		NORTH DISTRICT.		WEST DISTRICT.		
Diamet'r in Feet.	Previous to 1862.	From Jan. 1, 1862, to Apr. 1,'63.	Previous to 1862.	From Jan. 1, 1862, to Apr. 1,'63.	Previous to 1862.	From Jan. 1, 1862, to Apr. 1,'63.	TOTAL FEET.
6	......	567	3,895	......	1,292	......	5,754
5	361	......	4,761	......	17,090	......	22,212
4½	......	......	......	2,721	2,010	6,785	11,516
4	1,952	......	5,498	......	5,208	578	13,236
3	13,605	......	3,828	......	......	818	18,251
2½	19,478	......	......	......	......	......	19,478
2¼	6,359	......	......	......	......	......	6,359
2	20,258	......	34,409	734	31,175	459	87,035
1	66,225	2,075	25,227	450	23,772	498	118,247
	128,238	2,642	77,618	3,905	80,547	9,138	302,088*

CATCH BASINS AND MAN HOLES.

Total Catch Basins built previous to 1862, - - -		1,192
" " " " from Jan. 1, 1862, to Apr.1, '63,		72
		1,264
Total Man Holes built previous to 1862, -	2,135	
" " " " since Jan. 1, 1862, -	66	2,201

Of the above Catch Basins, there were built since Jan. 1, 1862—

In South District, 22, at a cost of -	$759.38
In West District, 37, " " " -	1,465.66
In North District, 13, " " " -	558.79
	$2,783.83 †

---

* Equal to $57\frac{1128}{5280}$ miles.

† Average $38.66 each.

COST OF CLEANSING SEWERS AND CATCH BASINS.

YEAR.	SEWERS.	CATCH BASINS.	TOTAL.
1859	$1,492.59	$479.00	$1,971.59
1860	5,087 08	532.40	5,619.48
1861	4,199.85	1,274.18	5,474.03
1862 and 1st Quar. 1863	4,146.10	627.25	4,793.35

1,232 catch basins cleansed in 1862-3.

Cost of repairs of sewers, catch basins, and man holes, in 1862, $2,196.30.

Mr. William H. Clarke, the Assistant Engineer of the Board, who has, together with Assistant Engineer, Wm. C. Bryson, had charge of the sewers constructed the past year, and who has for several years had special charge of the private drain department, reports that the following permits for house drain connections with the sewers have been issued during this period:

PART OF CITY.	4 in. drains.	6 in. drains.	9 in. drains.	Total.
North District....................	1	110	9	120
South District....................		167	11	178
West District....................		64	3	67
	1	341	23	365

Mr. Clarke further reports, that—

"All of the drains under these permits, (except nine, which have not yet been put in,) have been laid under his inspection, and plats have been made of the same, which have been transferred to the plans of the office.

"The whole number of private drains in the city now is, 2,802. The drain layers now acting under the licenses of the Board are generally disposed to do their work in conformity with the regulations thereof, and he has found no obstructions during this year, occurring in the drains laid by them, to be charged to defective construction. The obstructions have been, as heretofore, caused by the introduction of improper substances into the drains, such as grease, rags, etc., and have been chiefly confined to hotels, eating houses, railroad depots, etc.

"Seventy-six notices have been served upon the owners of lots in the several divisions of the city, requiring them to make connections with the sewers, or to put in order drains already laid, all of which have been complied with, with the exception of five, in two of which cases the drains have been put in by the Board and the expense of the work assessed upon the lots benefited, under the authority of the sewerage law, and three were, on account of the approach of winter, deferred until another season.

"In view of the filthy condition of some of the street gutters, occasioned by the discharge of wooden drains into them from the lots opposite, it is recommended that early in the season a general inspection of the streets should be made, and that drains should be ordered to connect such lots with the sewers wherever such nuisances exist in the sewered streets, beginning with those streets where the improvements are most valuable, and gradually extending such house drainage over all parts of the city where sewers are laid in the streets. This would not only be beneficial as a sanitary measure, but would diminish the expense of street cleaning very materially, and improve the character of the roadway of the streets. The beneficial effects of such general connections with the sewers has been fully shown by the operations of the past year, where the same has been done."

Besides the reasons given by Mr. Clarke for draining all lots which now cause nuisances by lacking such drainage, it should be remembered that the more lots and houses are drained into the sewers, the more perfect will be the action of the sewers, and the freer will they become from unpleasant smells in times of protracted drought.

The condition of the river, with recommendations relative to pumping it, will be found under the head of Water Works. The usual soundings were taken in the winter, and a slight accumulation of deposit was found to have been made in some places during the year. The expected freshet and scour of the river, at the breaking up of ice in the spring of 1862, did not take place. The freshet of this spring, from which very little was expected, is believed to have had a much greater scouring effect upon the river than that of last year, but it has not been convenient to take soundings since then.

Which is respectfully submitted.

E. S. CHESBROUGH,

City Engineer.

REPORT OF THE SUPERINTENDENT OF CEMETERY GROUNDS AND PUBLIC PARKS.

Chicago, April 10, 1863.

To the Board of Public Works of the City of Chicago:

Gentlemen:—I submit herewith the accompanying statements showing the improvements made under my charge from January 1, 1862, to April 1, 1863.

CHICAGO CEMETERY.

There have been clayed, graded and graveled in the Cemetery, 375 feet, from the main entrance of the Cemetery east to the County vault; thence north and north-west, 455 feet, to opposite Bates' (now Wright and McClure's) vault; thence north-east, 230 feet, to the first avenue, running east and west; thence west, along said avenue, 540 feet; thence north-west, the road along the west fence, 1,505 feet, to the third avenue, east and west, north of the main entrance; making, in all, three-fifths of a mile in length, and from one to two rods in width.

We have also clayed and graded the above mentioned third cross avenue, and are now ready for the graveling of the same. The clay has been put on the roads above mentioned, from two to four inches thick, and the gravel about two inches on the top of the same.

We have also cleaned from most of the alleys and lots the dead limbs, rubbish, etc.; trimmed the trees and cut down the underbrush; trimmed the trees in the northern part of the Cemetery, generally known as the Park; planted a row of maple trees along the first road, along the fence on the west side of the Cemetery, which are as yet all alive and doing well.

We further planted evergreens along the cross avenues (running east and west) and the center pieces, which I am able to report as all being alive and in good condition.

About six months ago a large portion of the west and south fence of the Cemetery was blown down and damaged by a strong wind, on account of the posts being rotten, and we have repaired it as well as is possible under the circumstances.

A portion of the fence on the east side of the Cemetery was almost covered by drifted sand. The boards of this fence being rotten, we considered it best not to raise it, but to put new boards above the old ones where the sand had covered them.

There have been buried in the public grounds during the time specified, 2,218 persons, exclusive of the rebel prisoners, which were 615 in number; making the total of interments in these grounds, 2,833. There was no record kept of the interments in the public grounds until June, 1861.

The number of burials on private lots I cannot report, for the reason that the grave diggers were not under my charge until after January 23, 1863. Since that time and up to date, there have been interred in private lots, sixty-two persons.

There was expended for the improvements herein named $3,943.11.

WASHINGTON PARK.

There have been set out in this park the past season, seventy trees. Twenty-seven have been broken or destroyed. I have replanted them without expense to the city. The posts at the gateways have been reset to keep out the cattle. I am informed that the posts are taken up to let the cattle into the park. If this evil continues, we shall be compelled either to maintain a watch, or use steps instead of posts, as at Union Park. I have cut walks across from the corners to keep persons off the sward. The Board having ordered that there be none but large trees planted for the city parks, we have planted eight on each side of the cross walks.

DEARBORN PARK.

Trees were planted last year in place of those that had previously died, and a few of the former are to be reset without cost. The citizens living near this park are desirous of having it better ornamented and more substantially improved than is possible with the small means appropriated for the parks of the city.

JEFFERSON PARK.

The fence was repaired, and one row of trees planted around and inside of the fence.

UNION PARK.

Repairs have been made on the fence, and some of the trees which had died have been replaced. About six tons of hay were cut, which was taken by the Water Department.

Respectfully submitted.

JOHN C. URE.

FINANCIAL STATEMENT.

Trial Balance, Ledger, Board of Public Works, March 31, 1863.

WATER DEPARTMENT.

	Dr.	Cr.
Water Works	$1,118,494.97	
Water Works Income		$933,538.99
Water Loan Bonds, 6 per cent		1,030,000.00
Water Loan Bonds, 7 per cent		103,000.00
Water Loan Interest	454,283.49	
Water expenses and repairs	321,889.21	
Discount on 6 per cent. Water Loan Bonds	82,235.41	
Water Fund in hands of City Treasurer	23,235.07	
Water Pipes	16,213.57	
Water Works Stock	12,055.49	
Water Works Coal	661.68	
Water Works Service Cocks	79.67	
Duncan, Sherman & Co., (Coupon acc't)	35,625.00	
Water Works Work Shop	1,765 43	
	$2,066,538 99	$2,066,538.99

WATER FUND.

Statement of the Cash Receipts by the Board of Public Works from January 1st, 1862, to March 1st, 1863, inclusive, and detailed statement of the cost of the various operations conducted by the Board during the same time.

RECEIPTS.

Water tax collected	$188,649.59		
Receipts shutting off and letting on water	137.04		
Receipts for tapping pipes	2,634.45		
" for sale of pipes, coal and materials	752.81		
Receipts for laying pipes and putting in hydrants on private premises	1,655.62	193,829.51	
Add—			
Balance in hands of City Treasurer January 1st, 1862		$11,136.38	$204,965.89

EXPENDITURES.

ADDITIONS TO WATER WORKS.

NEW MAIN ON PINE STREET, WABASH AVENUE, AND ADAMS STREET.

			Cash Payment.	True Cost.
Paid Scammon, McCagg & Fuller for legal opinion as to right of way			$25.00	$25.00

IMPROVEMENT OF GROUNDS AROUND PUMPING WORKS.

			Cash Payment.	True Cost.
Labor, filling and laying out grounds		$1,600.38		
Trees, evergreens, and labor planting		332.86		
Iron and castings for fence		926.01		
Stone and stone work for fence, coping and steps		1,275.05		
Lumber and posts		79.79		
Fountain		22.35		
Painting fence		50.44	4,286.88	
Add—				
Work at shop on fence	$519.59			
Depreciation of work shop fixtures	53.33	$572.92		4,859.80
Amounts carried forward			$4,311.88	$4,884.80

			CASH PAYMENT.	TRUE COST.
Amounts brought forward..................			$4,311.88	$4,884.80
SURVEY FOR OBTAINING THE SUPPLY OF WATER FROM A NEW LOCALITY.				
Labor of men boring for clay, etc....		$84.91		
Expense of boring apparatus.........		61.73	146.64	146.64
DISTRIBUTING PIPES LAID.				
Cast iron pipes, generally 4 and 6 inch.		$13,024.93		
Testing and laying pipes.............		2,533.72		
Trenching and back filling...........		4,448.33		
Lead.............................		3,266.99		
Rent of testing yard................		818.10		
Repairs of testing press.............		29.16		
Hauling pipes......................		478.84		
Dredging and repairing dock.........		260.57		
Caps, sleeves and small castings		353.62		
Hydrant patterns..................		72.83		
Hydrant and stop-cock boxes		576.42		
Catch basins for hydrants............		307.21		
River pipe		325.78		
Coal.............................		76.05		
Miscellaneous.....................		119 68	26,692.23	
ADD—				
Pipes used previously paid for..................	$13,478.03			
New hydrants put in......	463.23			
New stop-cocks put in......	380.69			
Work on press and tools at shop	48.04			
Oil used.................	7.44			
Deprec'n work shop fixtures	117.48	$14,494.91		
DEDUCT—				
Am't received for hydrants put in, work done and pipes laid for private parties...................	$1,655.62			
Lead charged repairs and meters................	59.77			
Pipes charged repairs....	89.35			
Pipes sold................	185.23	1,989.97		
		$12,504.94		39,197.17
Total addition to cost of Water Works.........			$31,150.75	$44,228.61

WORKING EXPENSES AND REPAIRS.

EXPENSES AT THE PUMPING WORKS.

		Cash Payment.	True Cost.
Salary of engineer and two assistants...	$3,445.00		
Firemen and laborers..................	2,375.50		
Coal, 2,341 $\frac{1672}{2000}$ tons	8,081.92		
Oil, 326½ gallons	247.54		
Tallow, 939 pounds....................	89.70		
Packing............................	46.97		
Iron work, $157.01; Hardware, $48.71	205.72		
Building drain and cock chamber......	35.16		
Carpenter work	38.50		
Gas, $234.60; Grate bars, $130.40.....	365.00		
Cotton waste........................	109.97		
Cleaning tank, $11; Rubber hose, $21..	32.00		
Weighing and stowing coal............	178.07		
Iron for foot walk on engine...........	93.03		
Painting and materials................	64.33		
Account books.......................	5.98		
Miscellaneous.......................	$109.03	$15,523.42	
Add—			
1326 $\frac{484}{2000}$ tons coal, previously paid for	$4,729.99		
Work done at shop..	247.40		
	$4,977.39		
Deduct—			
Oil, tallow, etc., used for inlet and laying pipe......................	29.65		
	$4,947.74		$20,471.16

MISCELLANEOUS OPERATING EXPENSES.

Wages, calkers and laborers on hydrants stop-cocks, etc..................	$2,676.63		
Analyzing water, and report thereon...	413.26		
Tools and hardware..................	37.95		
Lumber............................	74.65		
Hay, feed and oats..................	311.22		
Watching reservoir..................	155.00		
Labor building horse shed............	46.88		
Horse shoeing......................	33.31		
Harnesses and blankets	56.29		
Extending drain, South Reservoir....	16.25		
Building catch basins for hydrants.....	59.58		
Amounts carried forward........	$3,881.02	$15,523.42	$20,471.16

			Cash Payment.	True Cost.
Amounts brought forward		$3,881.02	$15,523.42	$20,471.16
Coal		17.29		
Miscellaneous		158.38	4,056.69	
Add—				
Work done at shop on tools, etc.	$28.58			
Depreciaʼn horses, wagons, etc.	366.50	$395.08		
Deduct—				
Receipts shutting off water, etc.		137.04		
		$258.04		4,314.73
REPAIRS.				
Reservoirs.—				
Iron work	$185.62			
Labor	120.00			
Glazing	29.25			
Carpenter work	17.87			
Extension drain	71.26			
Miscellaneous	154.64	$578.64		
Hydrants and Stop-Cocks.—				
Labor	$1,094.91			
Iron work	63.22			
Carpenter work	58.88			
Lumber	33.48			
Coal	37.79			
Miscellaneous	37.49	1,325.77	1,904.41	
Add—				
Work at shop on hydrants and stop-cocks		$197.84		
Work at shop for South Reservoir		54.32		
Hydrants substituted		534.05		
4-inch stop-cocks used		226.29		
6-inch " "		86.11		
8-inch " "		33.16		
Lead used		50.02		
Pipes used		89.35		
Depreciation in shop fixtures, old hydrants, and stop-cocks		1,010.53		
		$2,281.67		4,186.08
Amounts carried forward			$21,484.52	$28,971.97

			Cash Payment.	True Cost.
Amounts brought forward			$21,484.52	$28,971.97
IMPROVEMENT OF RESERVOIR GROUNDS.				
Filling grounds West Reservoir		$41.63		
Trees for reservoir grounds		75.00		
			116.63	116.63
CONSTRUCTING NEW INLET.				
Labor		$1,259.45		
Carpenter work		1,103.06		
Lumber		809.43		
Dredging		600.00		
Spikes and nails		69.82		
Use steam pump		80.00		
Coal		31.54		
Stone		31.85		
Miscellaneous		381.47	4,366.62	
Add—				
Work at shop		$44.83		
Oil, tallow, ropes, etc., used		17.11		
		$61.94		
Deduct—				
Lumber sold	$31.70			
Sand sold	10.00	41.70		
		$20.24		4,386.86
DREDGING BASIN.				
Expenses dredge work of basin at pumping works			959.69	959.69
WATER METERS.				
64 meters, freight, fittings, etc.		$4,383.67		
Repairs		412.69		
Setting		325.56		
Plumbing		192.33		
Carpenter work		90.01		
Lumber		30.25		
Iron work		143.26		
Miscellaneous		83.67	5,661 44	
Deduct—				
Valuation meters, charged stock	$3,033.80			
Plumbing paid back	7.30	$3,041.10		
Amounts carried forward		$3,041.10	$32,588.90	$34,435.15

			CASH PAYMENT.	TRUE COST.
Amounts brought forward		$3,041.10	$32,588.90	$34,435.15
ADD—				
Work at shop	$5.24			
Lead used	9.75	14.99		
		$3,026,11		2.635.33

OFFICE EXPENSES AND SALARIES.

Salaries, Commissioners	$2,918.62		
Salary, Secretary	600.00		
Salary, Engineer	1,200.00		
Salary, City Superintendent	400.00		
Salaries, Clerks	2,191.08		
Salaries, Water Assessor and Collectors	4,785.32		
Salaries, Draughtsmen	446.00		
Labor, care of office, etc.	254.50		
Blank books, stationery, binding and printing	834.93		
Advertising	140.18		
Newspapers	12.74		
Office furniture and repairs	138.44		
Expenses horse keeping and repairs buggy (ass'r.)	105.67		
Scientific books	98.35		
Miscellaneous	111.43	14,237.26	14,237.26
Total operating expenses		$46,826.16	$51,307.74

WORK SHOP.

Lathe, engine, planer, drill and belting	$940.26	
Shaft, flange and pulleys	64.96	
Labor	1,506.04	
Iron work	22.17	
Lumber	101.19	
Mason work	25.87	
Carpenter work	131.50	
Iron, steel and hardware	201.06	
Castings and bolts	2,107.20	
Coal	45.50	
Lead	53.15	
Miscellaneous	187.45	$5,386.35
Amount carried forward		$5,386.35

			CASH PAYMENT.	TRUE COST.
Amount brought forward....................			$5,386.35	
DEDUCT—				
Cash receipts for work....	$82.43			
Amount charged repairs ..	1,230.49			
Am't charged pump'g works	247.40			
Am't charged engine house improvement	572.92			
Am't charged new inlet ..	44.83			
Am't charged meters....	5.24			
Am't charged distributing pipes................	1,009.44			
Am't charged stock for stop-cocks....	404.69			
Am't charg'd miscellaneous	28.58	$3,626.02		
ADD—				
Oil used.........................		5.10		
		$3,620.92		1,765.43

BONDS PURCHASED.

10 Seven per cent. Bonds canceled................			9,291.17	
ADD—				
Discount on Bonds, less exchange on draft......................		$708.83		10,000.00

INTEREST.

Interest on Water Loan Bonds, July 1, 1862, and January 1, 1863.........		$69,010.00		
Commission to Duncan, Sherman & Co. exchange and advertising..........		340.41	69,350.41	
ADD—				
Amt transferred from Disct. to Inst.		$2,655.19		
DEDUCT—				
Discount on 10 Bonds purchased....		708.83		
		$1,956.36		71,306.77

STOCK.

Horses purchased....................		$275.00		
Amounts carried forward		$275.00	$84,027.93	$83,072.20

			Cash Payment.	True Cost.
Amounts brought forward		$275.00	$84,027.93	$83,372.20
Wagons and harnesses		166.50		
Hydrant and Box		15.00	456.50	
Add—				
Valuation stop cocks made at shop		404.69		
" meters furnished		3,033.80		
Balance, Atlas of City transferred		877.00		
Deduct—		$4,315.49		
Horse sold	$25.00			
Depreciation of meters, old hydrants, stop cocks etc	1,278.31	1,303.31		
		$3,012.18		3,468.68
COAL.				
Coal purchased not used			1,072.83	
Deduct—				
Amt. refunded for coal not received.		411.15		661.68
ATLAS FOR THE CITY.				
Locks and additions to Atlas			37.00	37.00
INCOME.				
Rents paid back		$121.31		
Uncurrent money taken		80.00	201.31	
WATER PIPES.				
Pipes purchased and not used			16,213.57	
SERVICE COCKS.				
Services of tapper		$649.98		
Service cocks purchased		846.93		
Cast iron boxes and iron work		144.77		
Permits not used refunded		5.50		
Tools and miscellaneous		97.59	1,744.77	
Add—		$1,744.77		
Service cocks previously paid for		122.83		
Amounts carried forward		$1,867.60	$103,753.81	$87,239.56

			Cash Payment.	True Cost.
Amounts brought forward		$1,867.60	$103,753.91	$87,239.56
Cash receipts for tapping,	$2,624.95			
Old cocks sold, and misc.	9.50			
Service cocks on hand April 1, 1863	79.67			
Profit on service cock ac.		846.52		
	$2,714.12	$2,714.12		
Total addition to Water Works brought forward			31,150.75	44,228.61
Total operating expenses brought forward			46,826.16	51,307.74
			$181,730.82	$182,775.91

Total amount of Cash expenditures	$181,730.82
Bal. of Cash in hands of City Treasurer, Apr. 1, '63,	23,235.07
	$204,965.89

SEWERAGE DEPARTMENT.

Trial Balance, Ledger, Board of Public Works, March 31st, 1863.

	Dr.	Cr.
Sewers North Division	$206,178.16	
Sewers South Division	256,395.57	
Sewers West Division	263,496.55	
S. Lind, Treasurer Sewerage Commissioners	108,696.53	
Sewerage Loan Bonds, 6 per cent		87,000.00
Sewerage Loan Bonds, 7 per cent		875,000.00
Sewerage Loan Bonds canceled		38,000.00
Sewerage Sinking Fund		42,398.26
Sewerage Sinking Fund Mortgages	25,717.10	
Discount on Sewerage Bonds	30,220.26	
Sewerage Loan Interest Account		27,761.52
House Drains	13,244.87	
Sewerage Pipes	8,379.46	
Sewerage Bricks	7.60	
Sewerage Stock	2,074.48	
American Exchange Bank	34,330.00	
Dennis Coughlin	1,561.51	
Patrick Smith	1,347.75	
Amounts carried forward	$951,649.84	$1,070,159.78

	CASH PAYMENT.	TRUE COST.
Amounts brought forward..................	$951,649.84	$1,070,159.78
Galena and Chicago Union Railroad Company......		382.55
Sewerage Funds in hands of City Treasurer	87,624.43	
Cement account.................	8.75	
Sewerage Sinking Fund with City Treasurer	10,430.60	
South half Lot 5, Block 123, S. S. Add............	6.68	
Lot 5, Block 1, Johnston, Roberts & Storrs' Add....	10.79	
Pittsburgh and Ft. Wayne Railroad Company		616.84
Z. Cobb, Ag't, S. 80 ft. W. half Lot 7, Block 36, O. T.	31.53	
Chicago Burlington and Quincy Railroad Company..		3,303.67
Charles H. Cook................................		69.00
Sewerage man hole and catch basin covers	758.68	
Sewerage expenses and repairs...................	23,783.09	
East quarter of Lot 2, Block 31, O. T..............	227.45	
	$1,074,531.84	$1,074,531.84

SEWERAGE FUND.

Statement of the Cash Receipts by the Board of Public Works, from January 1, 1862, to March 31, 1863, inclusive, and detailed statement of the cost of the various operations conducted by the Board during the same time.

RECEIPTS.

Am't received of J. Y. Scammon in settlement of balance of Sewerage Fund in Marine Bank.....	$52,994.56	
Proceeds sixty 7 per cent. bonds sold, and prem..	60,901.28	
Rec'd from city balance Sewerage Tax of 1861...	78,027.66	
Rec'd from city account Sewerage Tax of 1862..	70,570.36	
Rebate of interest on loan paid S. Sturges & Sons.	52.76	
Interest on collateral of E. I. Tinkham & Co.....	450.00	
House drain permits issued..................	1,822.50	
Materials sold and work done for private parties..	3,307.94	$268,127.06

EXPENDITURES.

SEWERS—SOUTH DIVISION.

Labor..............................	$1,475.44
Services Engineer.................	86.67
Amount carried forward...........	$1,562.11

			Cash Payment.	True Cost.
Amount brought forward		$1,562.11		
Cement		149.34		
Bricks		84.00		
Lumber		31.35		
Miscellaneous		34.50	1,861.30	
Add—				
Expense Sewer on Ringold Place	$4,069.68			
Cement used previously paid for	1.01			
Bricks used previously paid for	48.80			
Pipes used previously paid for	1,108.46			
Work done for Gas Co	5.72	$5,233.67		
Deduct—				
Receipts for work done		46.69		
		$5,186.98		7,048.28

SEWERS—WEST DIVISION.

		Cash Payment.	True Cost.
Labor	$1,334.31		
Cement	222.61		
Services Engineer	112.50		
Lumber	33.51		
Miscellaneous	11.79	1,714.72	
Add—			
Pipes used previously paid for	$588.56		
Bricks used previously paid for	11.20		
Expense sewer on Fulton street	19,184.21		
" " Adams "	8,446.01		
" " North "	2,214.52		
Exp'se sewer Canal and Jefferson st.	1,705.99		
Expense sewer Margaret street	69.00		
	$32,219.49		
Deduct—			
Receipts for work done	72.28		
	$32,147.21		33,861.93
Amounts carried forward		$3,576.02	$40,910.21

			Cash Payment.	True Cost.
Amounts brought forward..................			$3,576.02	$40,910.21
SEWERS—NORTH DIVISION.				
Labor		$1,565.60		
Earth for covering sewers............		238.26		
Services Engineer and Inspectors.....		125.00		
Repairs water pipes		12.96		
Lumber		37.87		
Cement...........................		19.48		
Miscellaneous.....................		23.33	2,022.50	
Add—				
Bricks used previously paid for..................	$100.80			
Pipes used previously paid for..................	417.35			
Covers used previously paid for..................	21.90			
Expense sewer Green Bay street...............	12,666.99			
Expense sewer Whitney street...............	1,151.26	14,358.30		
Deduct—				
Received for work done		26 50		
		$14,331.80		16,354.30
SEWERAGE INTEREST.				57264,51
Interest on Sewerage Loan Bonds, July 1, 1862, and January 1, 1863.......		$65,070.00		
Commissions to American Exch. Bank, Exchange and advertising		209.44		
Accrued interest on 20 bonds purch'ed		233.33		
Over remittance to Am. Exch. Bank to apply on interest due July 1, 1863...		700.00	66,212.77	
Add—				
Discount on balance funds in Marine Bank, as per agreement..........		$5,888.28		
Deduct—				
Int'st rebated by S. Sturges and Sons on loan paid before maturity..........	$52.76			
Interest and premium on 60 bonds sold.............	901.28	954.04		
		$4,934.24		71,147.01
Amounts carried forward			$71,811.29	$128,411.52

			Cash Payment.	True Cost.
Amounts brought forward			$71,811.29	$128,411.52
CLEANSING SEWERS—SOUTH DIVISION.				
Labor		$1,562.11		
Water for flushing		226.65		
Tools and repairs		52.46		
Miscellaneous		9.65	1,850.87	
Deduct—				
Receipts for work done		$2.25		1,848.62
CLEANSING SEWERS—WEST DIVISION.				
Labor		$1,161.52		
Water for flushing		226.65		
Tools and repairs		28.71		
Miscellaneous		13.18	1,430.06	
Deduct—				
Receipts for work done		$4.50		1,425.56
CLEANSING SEWERS — NORTH DIVISION.				
Labor		$1,352.87		
Water for flushing		226.65		
Tools and repairs		30 76		
Miscellaneous		12.78	1,623.06	1,623.06
REPAIRS OF SEWERS — SOUTH DIVISION.				
Labor		$808.98		
Tools and repairs		45.91		
Cement		40.32		
Services Engineer		15.31		
Lumber		2.58		
Miscellaneous		3.67	916.77	
Add—				
Cement used previously paid for	$3.04			
Bricks used previously paid for	97.37			
Covers used previously paid for	147.32			
Depreciation of tools, etc.	97.81	345.54		
Deduct—				
Receipts work done	$61.96			
Lumber sold	3.90	65.86		
		$279.68		1,196.45
Amounts carried forward			$77,632.05	$134,505.21

			Cash Payment.	True Cost.
Amounts brought forward			$77,632.05	$134,505.21
REPAIRS OF SEWERS — WEST DIVISION.				
Labor		$408.42		
Tools and repairs		45.91		
Cement		23.95		
Services Engineer		15.31		
Lumber		2.59		
Miscellaneous		1.67	497.85	
Add—				
Bricks used previously paid for	$55.78			
Covers used previously paid for	147.32			
Depreciation tools, etc.	97.81	$300.91		
Deduct—				
Receipts work done		1.46		
		$299.45		797.30
REPAIRS OF SEWERS — NORTH DIVISION.				
Labor		$586.46		
Tools and repairs		45.92		
Cement		52.16		
Labor Engineers		15.30		
Lumber		2.58		
Miscellaneous		.40	702.82	
Add—				
Bricks used previously paid for	$129.37			
Covers used previously paid for	147.32			
Depreciation tools, etc.	97.80	$374.49		
Deduct—				
Receipts for work done		46.99		
		$327.50		1,080.32
HOUSE DRAINS.				
Services Engineer		$1,500.00		
" Rodman		9.00		
Horse keeping for engineer		150.00		
Miscellaneous		69.85	1,728.85	
Amounts carried forward			$80,561.57	$136,832.83

			Cash Payment.	True Cost.
Amounts brought forward			$80,561.57	$136,332.83
Deduct—				
Cash receipts for permits	$1,822.50			
Permit charg'd ownert lots 17, 18, 19, block 67, O. T.	15.00	$1,837.50		
Add—				
Pipe injunctions used		847.47		
		$990.03		738.82

MAN HOLE AND CATCH BASIN COVERS.

Labor		$417.82		
Lumber		330.94		
Spikes and nails		119.50		
Tar		41.00	909.26	
Deduct—				
Covers sold	$71.62			
Covers used for sewers and repairs	468.96	$540.58		
Add—				
Covers on hand from stock account	$381.00			
Hauling lumber	9.00	390.00		
		$150.58		758.68

OFFICE EXPENSES AND SALARIES.

Salaries Commissioners		$2,706.29		
Secretary		750.00		
Engineer		1,500.00		
Assistant Superintendent		400.00		
Clerks		2,194.87		
Blank Books and Stationery		133.23		
Printing		62.02		
Advertising and daily papers		89.28		
Office fixtures and repairs		36.69		
Express charges on Bonds		80.00		
Lithographing Bonds		64.68		
Miscellaneous		62.70	8,079.76	
Amounts carried forward			$89,550.59	$137,830.33

			CASH PAYMENT.	TRUE COST.
Amounts brought forward			$89,550.59	$137,830.38
ADD—				
Expenses in suit against S. Lind transferred	$22.00			
Expense charges transfer'd.	30.00	$52.00		
DEDUCT—				
Advertising charged owners of Lots 17, 18, 19, Block 67, O. T.	$9.00			
Rec'd for Engineers' salaries	40.00	49.00		
		$3.00		8,082.76
GREEN BAY STREET SEWER.				
J. B. Benedict, and Carlin & McCabe, on contract		$6,675.09		
Cement		1,043.37		
Bricks		4,558.61		
Engineer and Inspectors		372.32	12,649.39	
ADD—				
Pipes used	$57.60			
DEDUCT—				
Bricks used for other sewers	40.00	17.60		12,666.99
WHITNEY STREET SEWER.				
Labor		$661.68		
Bricks		385.00		
Cement		127.85		
Services of Inspectors		15.93	1,190.46	
DEDUCT—				
Bricks used for other sewers	$60.80			
ADD—				
Pipes used	21.60	39.20		1,151.26
FULTON STREET SEWER.				
J. B. Benedict, on contract		$8,932.44		
Cement		2,446.52		
Bricks		7,128.60		
Engineers and Inspectors		525.96		
Miscellaneous		64.29	19,097.81	
Amounts carried forward			$122,488.25	$159,731.34

			CASH PAYMENT.	TRUE COST.
Amounts brought forward			$122,488.25	$159,731.34
ADD—				
Pipes used		$86.40		19,184.21
ADAMS STREET SEWER.				
J. Duffy, account contract		$3,898.73		
Cement		856.04		
Bricks		3,226.90		
Engineers and Inspectors		393.94		
Miscellaneous		33.50	8,409.11	
ADD—				
Pipes used		$36.90		8,446.01
NORTH STREET SEWER.				
Langan & McHugh on contract		$312.11		
Bricks		829.10		
Cement		221.39		
Services Engineers		25.00		
Miscellaneous		8.44	1,396.04	
ADD—				
Amount paid Langan & McHugh by C., B. & Q. R. R. Co	$700.00			
Pipe junctions used	37.20			
Covers used	9.00			
Miscellaneous labor transf'd	72.28	818.48		2,214.52
RINGOLD PLACE SEWER.				
J. B. Benedict, on contract		$2,663.81		
Engineers and Inspectors		289.82		
Bricks		1,105.75	4,058.88	
ADD—				
Pipes used		$10.80		4,069.68
LAKE STREET SEWER.				
Paid sundry parties amounts advanced by them to construct sewer			511.91	
Samuel T. Foss.				
Paid him am't advanced to construct sewer			175.00	
Amount carried forward			$137,039.19	

	Cash Payment.	
Amount brought forward	$137,039.19	
William Smith & Co.		
Paid them am't advanced to construct sewer	125.00	
S. Meyers.		
Paid him for 30,000 bricks previously purchased	157.50	
L. P. Hilliard.		
Labor and materials for drain	5.07	
C. Beers.		
Labor and materials	2.46	
South half Lot 5, Block 123, S. S. Add.		
Private drain constructed	6.68	
Lot 5, Block 1, Johnston R., & Stow's Add.		
Private drain constructed	10.79	
Stock.		
Oak sheeting and tools purchased	492.43	
Cement.		
Cement purchased	12.18	
Sewerage Pipes.		
Pipes purchased	488.15	
Sewerage Bricks.		
Bricks purchased	379.60	
Bills Payable.		
Paid loan to S. Sturges & Son	15,000.00	
MISCELLANEOUS.		
Proportion of delinquent taxes 1861 previously credited, not collected, paid back	1,191 59	
Amount paid to sinking fund for its proportion of sewerage tax 1861, collected	15,534.60	
Amount paid to sinking fund for its proportion of all cash received from late Board of Sewerage Commissioners	9,894.92	
Total cash expenditures	$180,340.16	
Add—		
Amount overdrawn with City Treasurer, Jan. 1, '62,	162.47	
Balance in hands of City Treasurer, April 1, 1863,	87,624.43	$268,127.06

SEWERAGE SINKING FUND.

RECEIPTS.

Interest on Sinking Fund mortgage—Hiram Joy	$887.02
Interest on Sinking Fund mortgage—Timothy Wright	2,486.46
Amount carried forward	$3,373.48

	Cash Payment.	True Cost.
Amount brought forward	$3,373.48	
Account of principal Sinking Fund mortgage—Timothy Wright	750.00	
Proportion of Sewerage Tax 1861	15,534.60	
Proportion of all Cash received from late Board of Sewerage Commissioners	9,894.92	
	$29,553.00	
Balance in hands City Treasurer, January 1, 1862	1,135.05	$30.668.05

EXPENDITURES.

20 Bonds purchased and canceled, Nos. 351 *B* to 370 *B*, inclusive, 7 per cent	$20,000.00	
Express charges on Bonds	30.00	
Certificates of Tax sales on East ½, of Lot 2 in Block 31, O. T., property embraced in sinking fund mortgage—W. Hilderbrand	227.45	
	$20,257.45	
Balance in hands of City Treasurer, April 1, 1863	10,430.60	$30.668.05

CITY DEPARTMENT.

Trial Balance, Ledger, Board of Public Works, March 31, 1863.

Chicago Cemetery		$655.54
Street Lamps West Division		301.25
City Appropriation Fund	$30,791.96	
North Division		6,544.32
South Division		1,973.51
West Division		6,546.76
Public Buildings		749.71
Lumber account	966.19	
Paving in front of Post office		814.66
Bridge Department		4,738.67
City expense account office		926.11
Chicago harbor		415.68
Public Parks		130.70
City proportional expense account		3,303.85
Intersections of streets		4,657.39
Special assessments	5,071.20	
Amounts carried forward	$36,769.35	$31,758.15

	CASH PAYMENT	TRUE COST.
Amounts brought forward	$36,769.35	$31,758.15
North Clark street improvement		471.00
Kinzie and North Water street improvement		4,012.08
Lake street improvement		528.80
Sidewalk improvements		8.00
South Water street improvement		131.90
South Wells street improvement	80.58	
	$36,909.93	$36,909.93

BOARD OF PUBLIC WORKS APPROPRIATION FUND.

Statement of the Cash Receipts by the Board of Public Works. from January 1, 1862, to March 31, 1863, inclusive, and detailed statement of the cost of the various operations conducted by the Board during the same time.

RECEIPTS.

Amount appropriated by Common Council	$76,593.16	
Street taxes collected	14,971.50	
Permits issued, etc	252.02	
Digging graves in cemetery, and sand sold	1,194.00	
Filling Haven school house lot	232.80	
Lumber sold to city	318.79	
Damage to bridges	87.56	
Rebate on assessments for street intersections	224.47	
From town of South Chicago	437.50	
	$94,311.80	
ADD—		
Am't of cemetery fund unexpended, Jan. 1, '62.	1,404.65	
	$95,716.45	
Balance with City Treasurer, Jan. 1, 1862	51,722.76	$147,439.21

EXPENDITURES.

SOUTH DIVISION.

Labor on streets and sidewalks	$10,445.19
Lumber	950.92
Stone	741.44
Gravel	963.32
Amount carried forward	$13,100.87

			Cash Payment.	True Cost.
Amount brought forward		$13,100.87		
Nails and spikes		249.39		
Services Engineer and Rodman		162.22		
Distributing street tax notices		625.50		
Printing street tax notices		13.50		
Street taxes refunded		3.00		
Repairing paving		188.81		
Repairing gutters		11.94		
Tools and repairs		64.86		
Building wall		92.32		
Altering catch basin		58.85		
Carpenter work		33.62		
Miscellaneous		113.23	$14,718.11	
Deduct—				
Permits issued and miscellaneous receipts	$11.80			
Filling Haven school house lot	232.80	344.60		14,373.51

WEST DIVISION.

Labor on streets and sidewalks		$10,308.57		
Lumber		1,973.62		
Stone		1,915.00		
Nails and spikes		443.42		
Distributing street tax notices		617.50		
Serving sidewalk notices		234.00		
Street taxes refunded		3.00		
Printing street tax notices		20.00		
Services Engineer and Rodman		162.23		
Tools and repairs		119.64		
Miscellaneous		16.08	$15,813.06	
Deduct—				
Permits issued, and misc. receipts		$61 00		15,752.06

NORTH DIVISION.

Labor on streets and sidewalks		$8,788.63		
Lumber		1,561.38		
Gravel		550.98		
Stone		128.35		
Nails and spikes		299.49		
Amounts carried forward		$11,328.83	$30,531.17	$30,125.57

			Cash Payment.	True Cost.
Amounts brought forward........		$11,328.83	$30,531.17	$30,125.57
Services Engineer, Rodman and Inspector		380.22		
Distributing street tax notices........		649.50		
Printing street tax notices...........		19.50		
Street taxes refunded...............		1.50		
Repairing paving		9.04		
Tools and Repairs..................		41.62		
Miscellaneous......................		20.48	12,450.69	
Deduct—				
Receipts for permits issued, and miscellaneous....................		$69.22		12,381.47

CHICAGO CEMETERY.

Labor and teams....................		$3,009.88		
Salary Superintendant		333.30		
Trees and shrubbery........		345.00		
Lumber............................		166.88		
Hardware and tools		82.20		
Miscellaneous......................		5.85	3,943 11	
Deduct—				
Receipts digging graves, sand sold, etc	$1,194.00			
Cemetery fund unexpen'd, January 1, 1862......	1,404.65	2,598.65		1,344.46

STREET LAMPS — WEST DIVISION.

105 Iron posts..................		$1,312.50		
105 Lamps and fittings		1,273.75	2,586.25	2,586.25

LUMBER ACCOUNT.

Lumber purchased not used................			809.66	
Deduct—				
Am't sold city and refunded for lumber not received		$307.79		501.87
Amounts carried forward....			$50,320.88	$46,939.62

PUBLIC BUILDINGS.

ENGINE HOUSES.

		Cash Payment.	True Cost.
Amounts brought forward		$50,320.88	$46.939.62
Carpenter work	$590.08		
Lumber	364.87		
Plumbing and gas fitting	201.11		
Iron work	33.51		
Nails	42.49		
Painting and glazing	76.62		
Ground rent lot engine house No. 15	30.00		
Roofing	79.10		
Miscellaneous	3.44	1,421.22	1,421.22

LARRABEE STREET ENGINE HOUSE.

Paid Wm. Arend balance contract for building	$378.00		
Interest on estimates	16.67	394.67	394.67

COURT HOUSE.

Carpenter work	$109.98		
Iron work	52.07		
Calcemining, painting and glazing	135.25		
Plastering Recorder's court room, and carpet for same	398.98		
Gas fitting	9.75		
Repairs roof	3.60		
Watching building	48.00		
Miscellaneous	28.00	785.63	785.63

NORTH MARKET.

Plumbing	$48.71		
Iron work	6.66		
Carpenter work	2.87		
Gas fixtures	2.25	60 49	60.49
Amounts carried forward		$52,982.89	$49,601.63

		Cash Payment.	True Cost.
Amounts brought forward		$52,982.89	$49,601.63
WEST MARKET.			
Plumbing	$9.00		
Gas fitting	9.50		
Lock and knob	5.40		
New doors	5.79		
Glazing	6.90	36.59	36.59
ARMORY.			
Locks, keys and hardware	$27.75		
Door	4.50		
Glazing	1.75	34.00	34.00
BRIDEWELL.			
Carpenter work	$30.38		
Lumber	58.57		
Tools	9.56		
Nails	5.00		
Glazing	9.62	113.13	113.13
BELL TOWERS.			
Iron work		$15.49	15.49
PEST HOUSE.			
Carpenter work and hatchet		$14.50	
Deduct—			
Received from city for work	$11.00		3.50
BRIDGE DEPARTMENT.			
Carpenter work	$327.81		
Spikes and nails	268.99		
Lumber	136.49		
Oakum, ropes and blocks	81.46		
Tools and hardware	50.54		
Amounts carried forward	$865.29	$53,196.60	$49,804.34

		CASH PAYMENT.	TRUE COST.
Amount brought forward	$865.29	$53,196.60	$49,804.34
Oil, turpentine, etc	155.90		
Hay and oats	70.93		
Chain	25.80		
Miscellaneous	37.65	11,55.57	1,155.57

NORTH AVENUE BRIDGE.

Salary of Tender	$385.00		
Carpenter work	31 12		
Lumber	13.86		
Painting	65.00		
Iron work	3.45		
Coal	3.69	502.12	502.12

CLYBOURNE AVENUE BRIDGE.

On contract for new bridge	$1,000.00		
Salary of Tender	65.00		
Carpenter work	27.50		
Iron work	1.07		
Lumber	6.89		
Painting	35.00		
Building bridge house	20.00	1,155.46	1,155.46

CHICAGO AVENUE BRIDGE.

Salary of Tender	$740.00		
Carpenter work	87.24		
Iron work and tools	25.87		
Lumber	25.04		
Coal	16.86		
Stove and pipe	5.05	900.06	900.06

ERIE STREET BRIDGE.

Salary of Tender	$740.00		
Carpenter work	46.25		
Lumber	36.49		
Coal	11.98		
Iron work and tools	9.10	843.82	843.82
Amounts carried forward		$57,753.63	$54,361.37

		Cash Payment.	True Cost.
Amounts brought forward		$57,753.63	$54,361.37
INDIANA STREET BRIDGE.			
Salary of Tender	$740.00		
Carpenter work	69.99		
Lumber	53.18		
Chain	34.43		
Nails and spikes	4 28		
Coal	7.38		
Iron work and tools	5 62	914.88	914.88
KINZIE STREET BRIDGE.			
Salary of Tender	$875.00		
Carpenter work	64.81		
Iron work	1.82		
Coal	9.88		
Lumber	29.19		
Painting	90.00	1,070.70	1,070.70
RUSH STREET BRIDGE.			
Salary of Tender	$1,105.00		
Carpenter work	227.31		
Iron work	145.58		
Coal	19.62		
Lumber	130.41		
Painting	120.00		
Oil	3.00		
Roofing	13.50		
Damage to horse and buggy	71.38	1,835.80	
Deduct—			
Received for damage to bridge	$43.56		$1,792.24
CLARK STREET BRIDGE.			
Salary of Tender	$1,105.00		
Carpenter work	144.72		
Iron work and tools	19.71		
Bell	25.00		
Coal	12.93		
Lumber	94.94		
Painting	110.00		
Blocks	1.95	1,514.25	1,514.25
Amounts carried forward		$63,089.26	$59,653.44

		Cash Payment.	True Cost.
Amounts brought forward		$63,089 26	$59,653.44
WELLS STREET BRIDGE.			
Contract for new bridge	$5,240.00		
Extra work	91.63		
Patent right Nicholson pavement approach	60.00		
Salary of Tender	1,215.00		
Carpenter work	294.00		
Iron work and tools	47.97		
Coal	19.80		
Lumber	293.61		
Piling	11.00		
Dredge work	87.50		
Roofing	38.00		
Painting	42.65		
Stove	5.35		
Repairs of schooner damaged by bridge	18 74	7,465.25	7,465.25
LAKE STREET BRIDGE.			
Salary of Tender	$1,025.00		
Carpenter work	187.68		
Iron work and tools	33.12		
Lumber	111.16		
Painting	110.00		
Piling	11.00		
Coal	7.38	1,485.34	
Deduct—			
Received for damage to bridge	19.00		1,466.34
RANDOLPH STREET BRIDGE.			
Salary of Tender	$1,025.00		
Carpenter work	72.32		
Iron work and tools	201.76		
Coal	16.86		
Painting	95.00		
Lumber	6.05		
Damage to vessel	23.00	1,439.99	1,439.99
MADISON STREET BRIDGE.			
Salary of Tender	$1,010.00		
Carpenter work	66.25		
Amounts carried forward	$1,076.25	$73,479.84	$70,025.02

		Cash Payment.	True Cost
Amounts brought forward	$1,076.25	$73,479.84	$70,025.02
Iron work and tools	42.80		
Coal	13.43		
Lumber	35.45		
Painting	75.00		
Stove and pipe	5.82	1,248.75	
DEDUCT—			
Received for damage to bridge	25.00		1,223.75
VAN BUREN STREET BRIDGE.			
Salary of Tender	$1,010.00		
Carpenter work	108.44		
Iron work and tools	4 91		
Coal	17.11		
Lumber	39.85		
Painting	110.00	1,290.31	1,290.31
POLK STREET BRIDGE.			
Salary of Tender	$830.00		
Carpenter work	84.18		
Iron work and tools	55.20		
Coal	13.42		
Lumber	29.48	1.012.28	1,012.28
TWELFTH STREET BRIDGE.			
Salary of Tender	$815.00		
Carpenter work	72.62		
Iron work and tools	17.17		
Coal	7.38		
Lumber	10.04		
Chain	35.63	957.84	957.84
OLD STREET BRIDGE.			
Salary of Tender	$800.00		
Carpenter work	93.73		
Iron work and tools	32.21		
Coal	9.48		
Lumber	32.87	968.29	968.29
Amounts carried forward		$78,957.31	$75,477.49

		CASH PAYMENT.	TRUE COST
Amounts brought forward		$78,957.31	$75,477.49
HALSTED STREET BRIDGE.			
Salary of Tender	$690.00		
Carpenter work	49.99		
Iron work and tools	6.62		
Coal	13.17		
Lumber	28.78		
Painting	90.00	878 56	878.56
PUMPING AND CLEANSING CHICAGO RIVER.			
Pumping at Bridgeport	$3,686.66		
Analyzing water and expenses survey	160.92		
Use of tug	20.00	3,867.58	3,867.58
OFFICE EXPENSES AND SALARIES.			
Salaries of Commissioners	$3,749.94		
" Secretary	900.00		
" Engineer	1,800.00		
" Assistant Superintendent	700.00		
" Clerks	3,246.21		
Blank books and stationery	140.04		
Advertising and daily papers	313.59		
Printing	210.95		
Office fixtures and repairs	39.32		
Miscellaneous	94.79	11,194.84	11,194.84
CHICAGO HARBOR.			
Dredge work	$232.50		
Removing piles	116.50		
Repairs life boats	95.68		
Taking soundings	37.31		
Filling dock at Canal street	10.00		
Removing sunken boats	12.00		
Use of scow	4.00	507.99	507.99
PUBLIC PARKS.			
Trees, planting and labor on Parks	$455.38		
Iron work on fences	166.25		
Amounts brought forward	$621.63	$95,406.28	$91,926.46

		Cash Payment.	True Cost.
Amounts brought forward	$621.63	$95,406.28	$91,926.46
Stone work on fences	114.50		
Carpenter work	52 50		
Lumber	6.50		
Nails	11.75		
Salary of Superintendent	66.66	873.54	
Deduct—			
Grass sold	$10.00		863.54

INTERSECTION OF STREETS.

Paving intersections on Lake street		$7,276.93		
“ “ South Water street		2,974.29		
Macadamizing intersections on Monroe st		418.62		
“ “ North Wells st		3,277.81		
Graveling “ Wabash avenue		240.00		
Paving “ Kinzie street		2,326.21		
Macadamizing “ Market street		760.11		
Paving and macadamizing intersections on South Wells street		3,031.37		
Grading intersections on West Jackson st		1.23		
Planking on alley B. 46, O. T.		17.89		
Paving intersections alley B. 17, O. T.		42.97	20,367.43	
Deduct—				
Rebate on Monroe street	$80.50			
“ Lake “	143.97	224.47		20,142.96
				$112,932.96
Total cash expenditures			$116,647.25	
Balance in hands of City Treasurer, April 1, 1863			30,791.96	
			$147,439.21	

GENERAL FUND.

Amount received by the Board of Public Works, for permits, belonging to the general fund	$377.00	
Amount paid City Treasurer		$377.00

SPECIAL ASSESSMENTS.

LAKE STREET IMPROVEMENT.

Balance unexpended Jan. 1, 1862.......	$13,261.20	
Old boulders sold De Golyer and McClelland.........................	1,200.00	
Area wall sub Lot 7, Block 16, O. T......	27.55	$14,488.75
Estimates paid De Golyer & McClelland.	$7,754.27	
Extras allowed.......................	72.00	
Rebates on assessment................	5,804.15	
Expenses making assessment...........	329.53	13,959.95
Balance due contractors....................		$528.80

SOUTH WATER STREET IMPROVEMENT.

Balance unexpended Jan. 1, 1862.......	$214.39	
Assessment roll for paving South Water st. with Nicholson pavement from Franklin to Lake street......................	7,035.30	7,249.69
Estimates paid De Golyer and McClelland	6,878.40	
Services Inspector and part expenses of making assessment	236.89	
Short rebate Dec. 5, 1861, on Lot 14, Block 8, Fort Dearborn Addition	2.50	$7,117.79
Balance to apply on expense making assessment..........................		$131.90

MONROE STREET IMPROVEMENT.

Assessment roll for macadamizing Monroe street from Clark to State street.....		$3,069.48
Estimates paid Danks and Nash.........	$2,400 00	
Extras allowed Danks and Nash.........	18.56	
Rebates on Assessment	593 92	
Expenses making assessment...........	57.00	3,069.48

NORTH WELLS STREET IMPROVEMENT.

Assessment roll for macadamizing North Wells street, from Kinzie street to Green Bay Road		$17,882.85
Amount carried forward...................		$17,882.85

Amount brought forward..................		$17,882.85
Estimates paid De Golyer & McClelland.	$17,098.18	
Sand and miscellaneous labor	524.67	
Inspecting work.....................	260.00	$17,882.85

KINZIE AND NORTH WATER STREETS IMPROVEMENT.

Assessment roll for paving Kinzie street from Clark to Rush streets, and North Water street, from the east terminus of Kinzie street to the west line of Rush street...		$15,882.20
Estimates paid De Golyer & McClelland..	$11,500.00	
Rebates on Assessment.............	370 12	11,870.12
Balance unexpended		$4,012.08

SOUTH CLARK STREET IMPROVEMENT.

Assessment roll for repaving South Clark street from the river to Lake street.......................	$1,025.44
Estimates paid De Golyer & McClelland............	1,025.44

NORTH CLARK STREET IMPROVEMENT.

Assessment roll for replanking North Clark street, from the river to New North Water street	$471.00

IMPROVEMENT OF ALLEY IN BLOCK 17, O. T.

Assessment roll for paving alley in Block 17, O. T..........................		$1,024 00
Estimates paid J. B. Benedict..........	$365.00	
Extras allowed "	14.13	
Rebates for planking instead of paving ..	533.00	
Expenses making assessment...........	111.87	$1,024.00

SIDEWALK IMPROVEMENTS.

Balance unexpended Jan. 1, 1862.......	$10.00	
Assessment for constructing sidewalk on North side of Illinois street between Butler, Wright and Webster's addition and Kingsbury street	103.40	113.40
Amount carried forward....................		$113.40

Amount brought forward		$113.40
Rebate to D. W. Mitchell, agent for sidewalk built	95.40	
Part expenses making assessment	10.00	105.40
Balance to apply on expense making assessment		$8.00

SOUTH WELLS STREET IMPROVEMENT.

Rebates on area walls built by owners	$80.58

B. CARPENTER,
FRED. LETZ,
J. G. GINDELE,
Commissioners of the Board of Public Works of the City of Chicago.

STATE OF ILLINOIS,
COUNTY OF COOK, } ss.
City of Chicago.

I, ANDREW J. MARBLE, Clerk of the City of Chicago, in the County and State aforesaid, do hereby certify that Benjamin Carpenter, Frederick Letz, and J. G. Gindele, the above named Commissioners of the Board of Public Works, appeared before me this second day of May, A. D. 1863, and made oath that the foregoing financial statement is true and correct.

A. J. MARBLE, *City Clerk.*

TD
25
C5
A3
2nd(1863)
RARE
BK RM